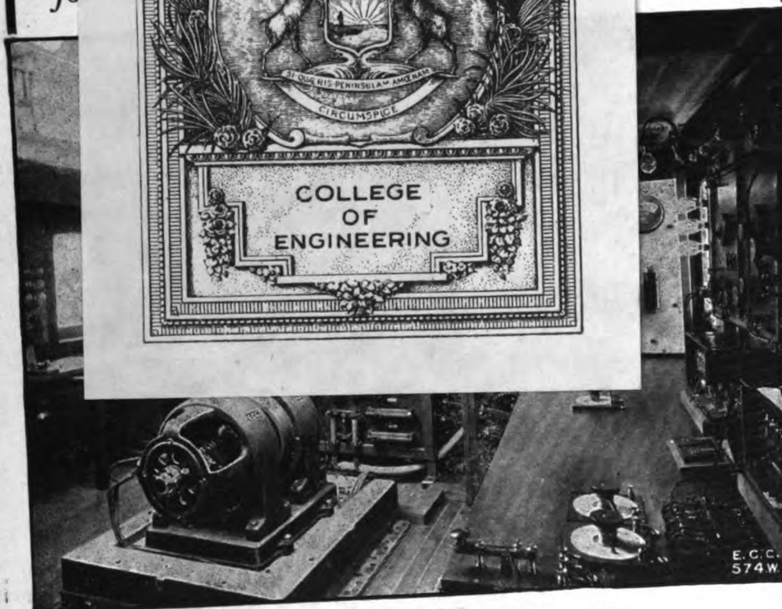
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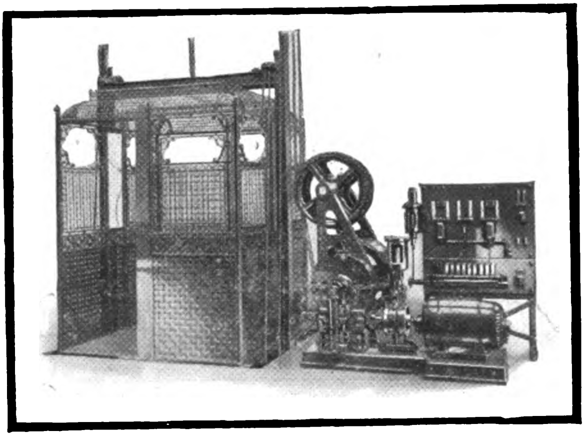


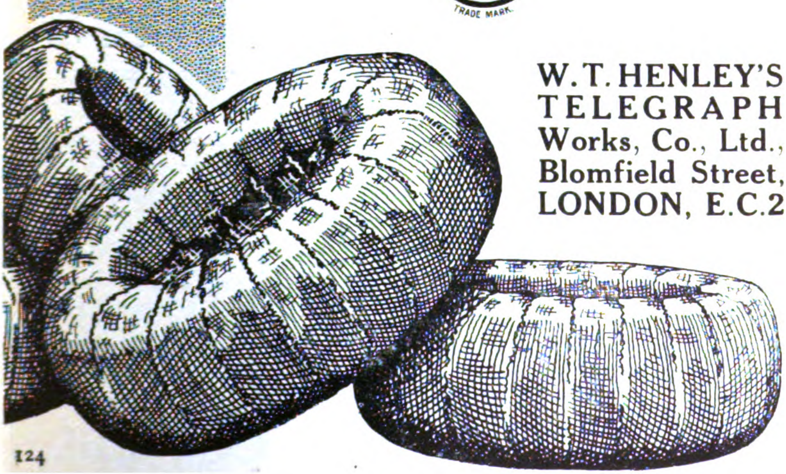
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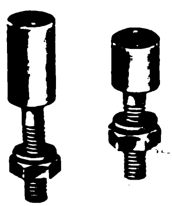
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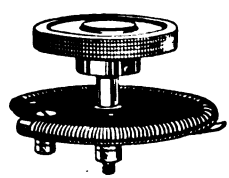


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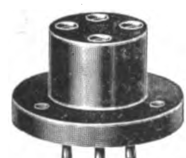
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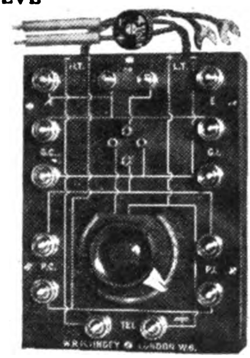
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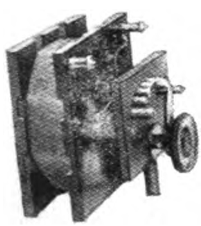


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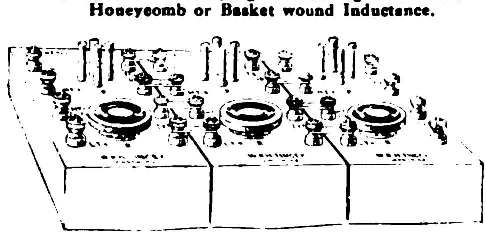
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CONTENTS

CONTENTS

CONTENTS

Details of the Larger Wireless Stations.

Station.	Date Installed.	Transmitter.	Towers. No.	Towers. Height.	Average Range.	Remarks.
HORSEA -	1914	1-100 K.W. Poulsen Arc	3	440′ wood	2500	Arc & towers designed by C. F. Elwell, —4th tower by C. F. Elwell, Ltd., 1921
EIFFEL TOWER	1915	2-100 K.W. Poulsen Arcs	1	985′ steel	2500	Arc equipment by C. F. Elwell
SALONIKA	1916	1-25 K.W. Poulsen Arc	1	400′ steel	1250	Arc equipment by C. F. Elwell
LYONS -	1916	2-200 K.W. Poulsen Arcs	8	400′ steel	3000	Arc equipment by C. F. Elwell
ROME -	1917	2-200 K.W. Poulsen Arcs	3	714′ wood	4200	Arc equipment and tower design by C. F. Elwell
NANTES -	1917	2-200 K.W. Poulsen Arc	6	600′ steel	3000	Arc equipment by C. F. Elwell
LYONS -	1918	2-350 K.W. Poulsen Arcs	6 2	600′ steel 656′ steel	4000	Arc equipment by C. F. Elwell
NORTHOLT	1921	2-25 K.W. Poulsen Arcs	3	446′ wood	1500	Arc and tower equipment and power plant by C. F. Elwell, Ltd.
LEAFIELD	1921	2-250 K.W. Poulsen Arcs	10	300′ steel	2200	Arc equipment by C. F. Elwell
ABU ZABAL	1921	2-250 K.W. Poulsen Arcs	12	300′ steel	2200	Arcs being installed by C. F. Elwell

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INDEX

NOTE.—The Land, Ship and Air Stations are not included in this Index. They are grouped together under the countries, page 557, in which the Land Stations are erected or to which the ships belong; and in the case of Air Stations in the Aviation Section.

Biographies form a special section, to which direct reference should be made.

INDEX

INDEX



INDEX

INDEX

c

INDEX TO ADVERTISERS

INDEX TO ADVERTISERS

CLASSIFIED INDEX TO ADVERTISERS

PREFACE

ALTHOUGH the progress of wireless telegraphy and telephony in the year 1921 was not marked by any outstanding features, considerable technical progress has been made along clearly defined lines, amongst which we might single out for special mention the improvements of the aerial and earthing systems at high-power stations, with a view to reducing energy losses and the development of high-speed working, with its accompanying development of methods of recording wireless signals. Both of these subjects are dealt with in our Special Article Section, wherein are printed important contributions from Dr. Meissner on "The Earthing Resistance of Antennae," and from Dr. Abraham on "The Recording of Wireless Signals." Further interesting and useful articles in this section relate to "The Birth and History of Long Distance Wireless Telegraphy," and "The Rectification Effect in its Reaction to the Composition and Structure of Crystals."

In pursuance of the policy maintained throughout all issues of this publication, the various standard sections have been revised, amplified, and brought up-to-date in accordance with the new knowledge made available during the past year. In this connection special referencc may be made to the Meteorological Section, the importance of which has greatly increased with the development of commercial flying and the improvement in the organisation of wireless services for weather reports. This section has been completely revised in the present issue by Mr. W. G. W. Mitchell, F.R.A.S., F.R.Met. Soc., and contains several new features of value.

The important part played by the wireless amateur in developing the art is coming to be more fully realised by the Government and the general public. The interests of this important section of the community is well catered for in the present "Year-Book" by

the amplification and development of the "Amateur and Experimental Section" which now includes a list of the licensed amateur transmitting stations of this country."

An entirely new feature of the present issue, and one which will be valued by amateur and professional alike, is the specially drawn map to the scale of one inch to a thousand miles, which gives for the first time a simple means of finding the distance and true direction of Wireless stations in all parts of the world, from London as the centre. Previously this information could only be obtained by difficult mathematical calculations or by measurements on a globe. With the new map it is only necessary to join London and the point in question by a straight line, every tenth of an inch being the equivalent of one hundred miles. If the line is carried to the edge of the map the exact angle from London is there indicated.

Other additions and improvements to the present issue we will leave to speak for themselves, meanwhile thanking many correspondents for excellent suggestions which we have been able to act upon, and for criticisms which have enabled us to improve the accuracy of our publication.

THE EDITOR.

12-13, Henrietta Street, Strand,
London, W.C.2,
27th February, 1922.

CALENDAR SECTION

(A) Almanack, January—December, 1922.

(B) Jewish and Mohammedan Calendars.

(C) Bank Holidays and Quarter Days.

(D) List of the World's Official Holidays.

(E) Tabular Calendars for 1921 and 1923.

JANUARY, 1922

PHASES OF THE MOON.*

			h.	m.				h.	m.
Jan. 6	☽	*First Quarter*	10	24	Jan. 20	☾	*Last Quarter*	6	0
13	○	Full Moon	14	36	27	●	New Moon	23	48

			SUN.* Rises. h. m.	SUN.* Sets. h. m.
1	**S**	**1st Sunday after Christmas.** Prof. Hertz died, 1894.	8 8	3 59
2	M		8 8	4 0
3	T	Capitulation of Port Arthur, 1905.	8 8	4 2
4	W	Marshal Joffre born, 1852.	8 7	4 3
5	Th		8 7	4 4
6	F	**Epiphany.** Twelfth day.	8 7	4 5
7	S		8 6	4 6
8	**S**	**1st Sunday after Epiphany.** Evacuation of Gallipoli, 1916.	8 6	4 8
9	M	International Conference for Safety of Life at Sea closed, 1914.	8 6	4 9
10	T	British Penny Postage established, 1840.	8 5	4 10
11	W	HILARY LAW SITTINGS BEGIN.	8 4	4 12
12	Th		8 4	4 13
13	F	*St. Hilary.*	8 3	4 15
14	S		8 2	4 16
15	**S**	**2nd Sunday after Epiphany.** British Museum opened, 1759.	8 2	4 18
16	M	Sir E. H. Shackleton reaches magnetic South Pole, 1909.	8 1	4 19
17	T	Benjamin Franklin born, 1706; died April 17th, 1790.	8 0	4 21
18	W	Capt. Scott reached South Pole, 1912.	7 59	4 22
19	Th	First German air raid by Zeppelins, 1915.	7 58	4 24
20	F	"Safety of Life at Sea" Convention signed at London, 1914.	7 57	4 26
21	S		7 56	4 28
22	**S**	**3rd Sunday after Epiphany.** Queen Victoria died, 1901.	7 55	4 29
23	M	*Republic* wrecked, 1909. Passengers and crew saved.	7 53	4 31
24	T	Naval Battle off Dogger Bank, 1915.	7 52	4 33
25	W	*Conversion of St. Paul.*	7 51	4 34
26	Th	Death of General Gordon and Fall of Khartoum, 1885.	7 50	4 36
27	F	William II, ex-German Emperor, born, 1859.	7 48	4 38
28	S	Röntgen Rays discovered, 1896.	7 47	4 40
29	**S**	**4th Sunday after Epiphany.** Capitulation of Paris, 1871.	7 46	4 41
30	M		7 44	4 43
31	T	*Great Eastern* steamer launched, 1858.	7 43	4 45

* The time shewn throughout this Calendar is Greenwich Mean Time.

FEBRUARY, 1922

PHASES OF THE MOON.

			h. m.				h. m.
Feb. 5	☽	*First Quarter*	4 52	Feb. 18	☾	*Last Quarter*	18 18
12	○	Full Moon	1 17	26	●	New Moon	18 8

			SUN. Rises. h. m.	SUN. Sets. h. m.
1	W		7 41	4 47
2	Th	*Candlemas.*	7 40	4 49
3	F	British Telegraphs transferred to Government, 1870.	7 38	4 51
4	S	Thomas Carlyle died, 1881.	7 36	4 52
5	**S**	**5th Sunday after Epiphany**	7 35	4 54
6	M		7 33	4 56
7	T	Chas. Dickens born, 1812; died June 9th, 1870.	7 31	4 58
8	W		7 30	5 0
9	Th		7 28	5 2
10	F	Lord C. Beresford born, 1846.	7 26	5 3
11	S	T. A. Edison born, 1847.	7 24	5 5
		London University founded 1826.	7 22	5 7
12	**S**	**Septuagesima Sunday**	7 20	5 9
13	M		7 19	5 11
14	T	*St. Valentine.*	7 17	5 13
		Russia abandoned the Allies, 1918.		
15	W	Sir Wm. Preece born, 1834.	7 15	5 14
16	Th		7 13	5 16
17	F	Sir Wilfred Laurier died, 1919.	7 11	5 18
18	S	German Submarine blockade declared, 1915.	7 9	5 20
19	**S**	**Sexagesima Sunday**	7 7	5 22
		Alessandro Volta born, 1745; died March 5th, 1827.		
20	M	Battle of Verdun begun, 1916.	7 5	5 23
21	T	Fall of Jericho, 1918.	7 3	5 25
22	W	Prof. Hertz born, 1857.	7 1	5 27
23	Th	Johann Karl Friedrich Gauss died, 1855.	6 59	5 29
24	F	*St. Matthias.*	6 57	5 31
25	S	Sir Christopher Wren died, 1723.	6 55	5 32
26	**S**	**Quinquagesima Sunday**	6 53	5 34
		La Provence sunk in Mediterranean, 1916. 870 persons saved.		
27	M		6 51	5 36
28	T	*Shrove Tuesday.*		
		Relief of Ladysmith, 1900.		

MARCH, 1922

PHASES OF THE MOON.

			h.	m.				h.	m.
Mar. 6	☽	*First Quarter*	19	22	Mar. 20	☾	*Last Quarter*	8	43
13	○	Full Moon	11	14	28	●	New Moon	13	3

			SUN. Rises. h. m.	SUN. Sets. h. m.
1	W	**Ash Wednesday**	6 48	5 38
2	Th	*St. Chad.*	6 46	5 39
3	F	Dr. Alexander Bell born, 1847.	6 44	5 41
4	S	Inauguration Day, U.S.A.	6 42	5 43
5	**S**	**1st Sunday in Lent** Alessandro Volta died, 1827.	6 40	5 45
6	M		6 37	5 47
7	T		6 35	5 48
8	W	Royal Institution founded, 1799.	6 33	5 50
9	Th	Battle of Vimy Ridge, 1917.	6 31	5 52
10	F	Battle of Neuve Chapelle, 1915.	6 29	5 53
11	S	Baghdad captured, 1917.	6 26	5 55
12	**S**	**2nd Sunday in Lent** John F. Daniell born, 1790; died March 13th, 1845.	6 24	5 57
13	M		6 22	5 59
14	T		6 20	6 0
15	W	Abdication of Czar, 1917.	6 17	6 2
16	Th	Georg Simon Ohm born, 1787; died July 7th, 1854. Senatore G. Marconi married at St. George's, Hanover Square, to the Hon. Beatrice O'Brien, 1905.	6 15	6 4
17	F	*St. Patrick.*	6 13	6 5
18	S	Dardanelles naval attack, 1915.	6 10	6 7
19	**S**	**3rd Sunday in Lent** First meeting of Empire War Cabinet, 1917.	6 8	6 9
20	M	Sir Isaac Newton died, 1727; born December 25th (O.S.), 1642.	6 6	6 11
21	T	Battle of Cambrai, 1918.	6 4	6 12
22	W	Battle of St. Quentin, 1918.	6 1	6 14
23	Th	*Maundy Thursday.*	5 59	6 16
24	F	*Sussex* torpedoed, 1916.	5 57	6 17
25	S	Lady Day.	5 54	6 19
26	**S**	**4th Sunday in Lent** Battle of Gaza, 1917.	5 52	6 21
27	M	English Channel spanned by wireless, 1899. Wm. Konrad von Röntgen born, 1845	5 50	6 22
28	T		5 48	6 24
29	W		5 45	6 26
30	Th	Captain Scott died, 1912.	5 43	6 27
31	F	Robert Wilhelm Bunsen born, 1811, died August 6th, 1899.	5 41	6 29

APRIL, 1922

PHASES OF THE MOON.

			h.	m.				h.	m.
Apr. 5	☽	*First Quarter*	5	46	Apr. 19	☾	*Last Quarter*	0	54
11	○	Full Moon	20	44	27	●	New Moon	5	4

			SUN. Rises. h. m.	Sets. h. m.
1	S	*All Fools' Day.*	5 38	6 31
2	**S**	**Passion Sunday** Battle of Copenhagen, 1801.	5 36	6 32
3	M		5 34	6 34
4	T	Sir William Crookes, O.M., died, 1919; born, June 17th, 1832.	5 32	6 36
5	W	United States declared war on Germany, 1917.	5 30	6 37
6	Th	Prof. Adolf Slaby died, 1913; born, 1850. Commander Peary reached North Pole, 1909.	5 27	6 39
7	F	Archbishop of Canterbury born, 1848.	5 25	6 41
8	S	Anglo-French Convention signed, 1904.	5 23	6 42
9	**S**	**Palm Sunday.** Vimy Ridge taken, 1917.	5 21	6 44
10	M		5 18	6 46
11	T	American Civil War commenced, 1861.	5 16	6 47
12	W	Albert Medal (Royal Society of Arts) presented to Senatore G. Marconi, 1914.	5 14	6 49
13	Th	Magdala, 1868.	5 12	6 51
14	F	**Good Friday.** President Lincoln assassinated, 1865.	5 10	6 52
15	S	*Titanic* disaster, 1912; over 700 lives saved.	5 7	6 54
16	**S**	**Easter Day** HILARY LAW SITTINGS END.	5 5	6 56
17	M	**Easter Monday** Benjamin Franklyn died, 1790.	5 3	6 57
18	T	**Easter Tuesday.** Earthquake and fire at San Francisco, 1906.	5 1	6 59
19	W	Lord Beaconsfield died, 1881.	4 59	7 0
20	Th		4 57	7 2
21	F	"Mark Twain" died, 1910.	4 55	7 4
22	S	Foundation of Royal Society, 1662.	4 53	7 5
23	**S**	**Low Sunday.** Shakespeare died, 1616.	4 51	7 7
24	M	Russo-Turkish War begun, 1877.	4 49	7 9
25	T	Senatore Guglielmo Marconi, G.C.V.O., born, 1874.	4 47	7 10
26	W	Allied Troops land at Gallipoli, 1915.	4 45	7 12
27	Th	Samuel F. B. Morse born, 1791; died, 1872.	4 43	7 14
28	F	Prof. Guthrie Tate born, 1831; died July 4th, 1901.	4 41	7 15
29	S	EASTER LAW SITTINGS BEGIN.	4 39	7 17
30	**S**	**2nd Sunday after Easter** Johann Karl Friedrich Gauss born, 1777; died February 23rd, 1855.	4 37	7 19

MAY, 1922

PHASES OF THE MOON.

			h. m.				h. m.
May 4	☽	*First Quarter*	12 56	May 18	☾	*Last Quarter*	18 17
11	○	Full Moon	6 6	26	●	New Moon	18 4

			SUN. Rises. h.m.	SUN. Sets. h. m.
1	M	Duke of Connaught born, 1850.	4 35	7 20
2	T		4 33	7 22
3	W	Jamaica discovered, 1494.	4 31	7 23
4	Th	Italy denounced Treaty of Triple Alliance, 1915.	4 29	7 25
5	F		4 27	7 27
6	S	Accession of King George V., 1910.	4 26	7 28
7	S	**3rd Sunday after Easter** *Lusitania* torpedoed, 1915.	4 24	7 30
8	M		4 22	7 32
9	T	Half-Quarter Day.	4 21	7 33
10	W	Imperial Institute, London, opened, 1893.	4 19	7 35
11	Th	Halley's comet appeared, 1910.	4 17	7 36
12	F		4 16	7 38
13	S		4 14	7 39
14	S	**4th Sunday after Easter** First vaccination by Dr. Jenner, 1796.	4 13	7 41
15	M	Presentation of Franklin Medal to Senatore Marconi, 1918.	4 11	7 42
16	T		4 10	7 44
17	W		4 8	7 45
18	Th	New Eddystone Lighthouse opened, 1882.	4 7	7 47
19	F	Last Air Raid, London, 1918.	4 5	7 48
20	S	Christopher Columbus died, 1506.	4 4	7 50
21	S	**Rogation Sunday** Manchester Ship Canal opened, 1894.	4 3	7 51
22	M		4 1	7 52
23	T		4 0	7 54
24	W	Empire Day.	3 59	7 55
25	Th	**Ascension Day.** Lloyd's incorporated, 1871.	3 58	7 56
26	F	*Corpus Christi.*	3 57	7 58
27	S	*Majestic* torpedoed, 1915.	3 56	7 59
28	S	**Sunday after Ascension** Annexation of Orange Free State, 1900.	3 55	8 0
29	M	*Empress of Ireland* disaster, 1914; 541 lives saved.	3 54	8 1
30	T	General Holiday in U.S.A.	3 53	8 2
31	W	Battle of Jutland, 1916.	3 52	8 4

JUNE, 1922

PHASES OF THE MOON.

			h. m.				h. m.
June 2	☽	*First Quarter*	18 10	June 17	☾	*Last Quarter*	12 3
9	○	Full Moon	15 58	25	●	New Moon	4 20

			SUN. Rises. h. m.	SUN. Sets. h. m.
1	Th		3 50	8 5
2	F	First British Patent for Wireless Telegraphy lodged, 1896.	3 50	8 6
3	S	King George V. born, 1865.	3 49	8 7
4	S	**Whit Sunday** George III. born, 1738.	3 49	8 8
5	M	**Whit Monday** Earl Kitchener drowned, 1916.	3 48	8 9
6	T	EASTER LAW SITTINGS END.	3 48	8 10
7	W	Messines Ridge captured, 1917.	3 47	8 11
8	Th		3 46	8 11
9	F	Charles Dickens died, 1870.	3 46	8 12
10	S	André Marie Ampère born, 1775; died, 1836.	3 46	8 13
11	S	**Trinity Sunday.** *St. Barnabas.*	3 45	8 14
12	M	Sir Oliver Lodge born, 1851.	3 45	8 14
13	T	James Clark Maxwell born, 1831.	3 45	8 15
14	W	Allied Economic Conference at Paris, 1916.	3 44	8 16
15	Th	Trans-Atlantic flight by Alcock and Brown, 1919.	3 44	8 16
16	F	*Drummond Castle* lost, 1896.	3 44	8 17
17	S	TRINITY LAW SITTINGS BEGIN. Sir W. Crookes born, 1832.	3 44	8 17
18	S	**1st Sunday after Trinity** War with U.S.A., 1812. Waterloo, 1815.	3 44	8 17
19	M	Field-Marshal Earl Haig born, 1861.	3 44	8 18
20	T	Accession of Queen Victoria, 1837.	3 44	8 18
21	W	Germans sink their warships at Scapa Flow, 1919.	3 44	8 18
22	Th	M. Poincaré announced to the Académie des Sciences Becquerel's discovery of a positive electron in a Crookes tube, 1908.	3 45	8 19
23	F	Formal institution of Royal Society of Edinburgh, 1783.	3 45	8 19
24	S	*St. John the Baptist.* Midsummer Day.	3 45	8 19
25	S	**2nd Sunday after Trinity** Navigation Acts repealed, 1849.	3 46	8 19
26	M	Lord Kelvin born, 1824; died December 17th, 1907.	3 46	8 19
27	T	Navigation Acts repealed, 1849.	3 46	8 19
28	W	Peace signed between Germany and the Allies, 1919	3 47	8 19
29	Th	*St. Peter.*	3 47	8 19
30	F	Tower Bridge opened, 1894. Lord Rayleigh died 1919; born Nov. 12th, 1842.	3 48	8 18

JULY, 1922

PHASES OF THE MOON.

			h. m.				h. m.
July 1	☽	*First Quarter*	22 52	July 17	☾	*Last Quarter*	5 11
9	○	Full Moon	3 7	24	●	New Moon	12 47

July 31 ☽ *First Quarter* 4h. 22m.

			SUN. Rises. h. m.	SUN. Sets. h. m.
1	S	British Offensive opened on the Somme, 1916.	3 49	8 18
2	S	**3rd Sunday after Trinity**	3 49	8 18
3	M	Sadowa, 1866.	3 50	8 17
4	T	Declaration of American Independence, 1776.	3 51	8 17
5	W		3 52	8 17
6	Th	King George's marriage, 1893.	3 52	8 16
7	F	Daylight Air Raid on London, 1917.	3 53	8 15
8	S	Joseph Chamberlain born, 1836; died July 2nd, 1914.	3 54	8 15
9	S	**4th Sunday after Trinity** Conquest of German South-West Africa, 1915.	3 55	8 14
10	M		3 56	8 13
11	T	Bombardment of Alexandria, 1882.	3 57	8 13
12	W	Electric Units Bill legalising electric standards passed Congress, U.S.A., 1894.	3 58	8 12
13	Th	R 34 accomplished Atlantic Flight, 1919.	3 59	8 11
14	F	Bastille stormed, 1789. French Public Holiday.	4 0	8 10
15	S	Battle of the Marne begun, 1918. Conquest of German South-West Africa, 1915.	4 2	8 9
16	S	**5th Sunday after Trinity** Nicholas II. of Russia assassinated, 1918.	4 3	8 8
17	M		4 4	8 7
18	T	Foch's counter-attack begun, 1918.	4 5	8 6
19	W		4 6	8 5
20	Th	*St. Margaret.*	4 8	8 4
21	F	Robert Burns died, 1796.	4 9	8 3
22	S	*St. Mary Magdalene.*	4 10	8 1
23	S	**6th Sunday after Trinity** Austrian Ultimatum to Serbia, 1914.	4 12	8 0
24	M	Honorary G.C.V.O. conferred on Senatore Marconi, 1914.	4 13	7 59
25	T	*St. James.*	4 14	7 57
26	W		4 16	7 56
27	Th	Captain Fryatt shot, 1916.	4 17	7 55
28	F	Austria-Hungary declared war on Serbia, 1914.	4 19	7 53
29	S	Spanish Armada dispersed, 1588. TRINITY LAW SITTINGS END.	4 20	7 52
30	S	**7th Sunday after Trinity**	4 21	7 59
31	M	Passing of British Telegraph Act, 1868.	4 23	7 49

AUGUST, 1922

PHASES OF THE MOON.

			h.	m.				h.	m.
Aug. 7	○	Full Moon	16	19	Aug. 22	●	New Moon	20	34
15	☾	*Last Quarter*	20	46	29	☽	*First Quarter*	11	55

			SUN. Rises. h. m.	SUN. Sets. h. m.
1	T	*Lammas Day.*	4 24	7 47
2	W	Fall of Soissons, 1918.	4 26	7 45
3	Th	Germany declared war on France, 1914.	4 27	7 44
4	F	Great Britain declared war on Germany, 1914. First International Wireless Conference met at Berlin, 1903. Suspension of Transatlantic Wireless Service, 1917	4 29	7 42
5	S	First British-American cable worked, 1858.	4 31	7 40
6	**S**	**8th Sunday after Trinity.** *Transfiguration.*	4 32	7 39
7	M	BANK HOLIDAY	4 34	7 37
8	T		4 35	7 35
9	W	Heligoland formally ceded to Germany, 1890.	4 37	7 33
10	Th	France declared war on Austria-Hungary, 1914.	4 38	7 31
11	F	Cardinal Newman died, 1890.	4 40	7 29
12	S	Great Britain declared war on Austria-Hungary, 1914.	4 41	7 28
13	**S**	**9th Sunday after Trinity.** Liége forts destroyed, 1914.	4 43	7 26
14	M		4 44	7 24
15	T	Panama Canal opened, 1914.	4 46	7 22
16	W	Robert Wilhelm Bunsen died, 1899; born March 31st, 1811. William Hyde Wollaston born, 1776; died, December 22nd, 1828.	4 48	7 20
17	Th		4 49	7 18
18	F		4 51	7 16
19	S	White Star liner *Arabic* sunk by German submarine, 1915.	4 52	7 14
20	**S**	**10th Sunday after Trinity.** Italy declared war on Turkey, 1915.	4 54	7 12
21	M		4 56	7 10
22	T	Fall of Namur, 1914.	4 57	7 8
23	W	Chas. Augustin de Coulomb born, 1736; died 1806	4 59	7 5
24	Th	*St. Bartholomew.* Louvain destroyed, 1914.	5 0	7 3
25	F	Conquest of Togoland, 1914.	5 2	7 1
26	S	Roumania declared war on Austria-Hungary, 1916	5 3	6 59
27	**S**	**11th Sunday after Trinity.** Italy declared on war Germany, 1916.	5 5	6 57
28	M	Germany declared war on Roumania, 1916. Trial of first submarine telegraph, 1850.	5 7	6 55
29	T		5 8	6 53
30	W	Turkey declared war on Roumania, 1916.	5 10	6 50
31	Th	Hermann von Helmholtz born, 1821; died September 8th, 1894.	5 11	6 48

SEPTEMBER, 1922

PHASES OF THE MOON.

				h. m.				h. m.
Sept	6	○	Full Moon	7 47	Sept. 21	●	New Moon	4 38
	14	(	*Last Quarter*	10 20	27	)	*First Quarter*	22 40

			SUN. Rises. h. m.	SUN. Sets. h. m.
1	F	*St. Giles.* Fall of Péronne, 1918.	5 13	6 46
2	S	Board of Trade (Great Britain) constituted, 1786.	5 15	6 44
3	S	**12th Sunday after Trinity** Fall of Riga, 1917.	5 16	6 42
4	M	First Night Aeroplane Raid on London, 1917.	5 18	6 39
5	T		5 19	6 37
6	W	*Mayflower* sailed, 1620.	5 21	6 35
7	Th	*St. Evurtius.*	5 23	6 33
8	F	Sir John Henniker Heaton, Bart., died, 1914; born 1848.	5 24	6 30
9	S	Luigi Galvani born, 1737; died December 4th, 1798.	5 26	6 28
10	S	**13th Sunday after Trinity**	5 27	6 26
11	M	First Battle of the Aisne, 1914.	5 29	6 24
12	T	Rt. Hon. H. H. Asquith born, 1852.	5 31	6 21
13	W	Quebec taken, 1759.	5 32	6 19
14	Th	*Holy Cross.*	5 34	6 17
15	F	Liverpool and Manchester Railway opened, 1830.	5 35	6 14
16	S	Mr. A. Bonar Law born, 1858.	5 37	6 12
17	S	**14th Sunday after Trinity** London and Birmingham Railway opened, 1838.	5 39	6 10
18	M	Jean Barnard Leon Foucault born, 1819; died, March 11th, 1908.	5 40	6 7
19	T		5 42	6 5
20	W	Delhi Day.	5 43	6 3
21	Th	*St. Matthew.*	5 45	6 0
22	F	Michael Faraday born, 1791; died August 25th, 1867.	5 47	5 58
23	S	Autumnal Equinox.	5 48	5 56
24	S	**15th Sunday after Trinity**	5 50	5 54
25	M	Bulgarians proposed armistice, 1918.	5 51	5 51
26	T	King of Denmark born, 1870.	5 53	5 49
27	W		5 55	5 47
28	Th	British captured Kut-el-Amara, 1915.	5 56	5 44
29	F	*St. Michael and All Angels.*	5 58	5 42
30	S	Surrender of Bulgaria, 1918.	6 0	5 40

OCTOBER, 1922

PHASES OF THE MOON.

			h. m.				h. m.
Oct. 6	○	Full Moon	0 58	Oct. 20	●	New Moon	13 40
13	☾	*Last Quarter*	21 55	27	☽	*First Quarter*	13 26

			SUN. Rises. h. m.	SUN. Sets. h. m.
1	S	**16th Sunday after Trinity** Pheasant shooting begins.	6 1	5 37
2	M		6 3	5 35
3	T		6 5	5 33
4	W	German proposal for armistice, 1918.	6 6	5 31
5	Th	Republic of Portugal proclaimed, 1910.	6 8	5 28
6	F	Invasion of Serbia by Germans, 1915.	6 9	5 26
7	S		6 11	5 24
8	S	**17th Sunday after Trinity**	6 13	5 22
9	M	Cambrai retaken, 1918. Germans occupied Antwerp, 1914.	6 14	5 19
10	T	Panama Canal completed, 1913.	6 16	5 17
11	W	*Volturno* burnt in mid-Atlantic, 1913. 521 persons saved.	6 18	5 15
12	Th	Nurse Cavell shot by Germans, 1915.	6 19	5 13
13	F	MICHAELMAS LAW SITTINGS BEGIN.	6 21	5 11
14	S	Great Britain declared war on Bulgaria, 1915.	6 23	5 9
15	S	**18th Sunday after Trinity** The Gregorian Calendar introduced, 1582.	6 25	5 6
16	M	Houses of Parliament burnt, 1834.	6 26	5 4
17	T		6 28	5 2
18	W	*St. Luke.*	6 30	5 0
19	Th	Sir Charles Wheatstone born, 1802; died, 1875. First battle of Ypres began, 1914.	6 31	4 58
20	F		6 33	4 56
21	S	Trafalgar Day. Death of Lord Nelson, 1805.	6 35	4 54
22	S	**19th Sunday after Trinity** Edouard Branly born, 1844.	6 37	4 52
23	M		6 38	4 50
24	T	French Victory at Verdun, 1916.	6 40	4 48
25	W	*St. Crispin.*	6 42	4 46
26	Th	Aleppo taken, 1918.	6 44	4 44
27	F	Austria sued for peace, 1918.	6 45	4 42
28	S	*St. Simon and St. Jude.*	6 47	4 40
29	S	**20th Sunday after Trinity**	6 49	4 38
30	M	Armistice with Turkey, 1918.	6 51	4 36
31	T	Beersheba taken, 1917.	6 52	4 34

NOVEMBER, 1922

PHASES OF THE MOON

				h.	m.					h.	m.
Nov.	4	○	Full Moon	17	41	Nov.	19	●	New Moon	0	6
	12	☾	*Last Quarter*	7	52		26	☽	*First Quarter*	8	15

			SUN. Rises. h. m.	SUN. Sets. h. m.
1	W	*All Saints.* Naval Battle off Coronel, 1914.	6 54	4 32
2	Th	*All Souls.*	6 56	4 30
3	F	Yarmouth bombarded, 1914.	6 58	4 29
4	S		7 0	4 27
5	**S**	**21st Sunday after Trinity** Great Britain declared war on Turkey, 1914. James Clerk-Maxwell died, 1879.	7 1	4 25
6	M	Sir Wm. Preece died, 1913; born Feb. 15th, 1834.	7 3	4 24
7	T	"London Gazette" first published, 1565.	7 5	4 22
8	W	John Milton died, 1674.	7 7	4 20
9	Th		7 9	4 19
10	F	British at Mons, 1918.	7 10	4 17
11	S	*Martinmas.* Armistice Day.	7 12	4 16
12	**S**	**22nd Sunday after Trinity** International Conference for Safety of Life at Sea opened, 1913. Lord Rayleigh born 1842; died June 30th, 1919.	7 14	4 14
13	M	Prof. Clerk Maxwell born, 1831; died November 5th, 1879.	7 16	4 13
14	T	Earl Roberts, V.C., died, 1914.	7 17	4 11
15	W	*St. Machutus.*	7 19	4 10
16	Th	First Fleming Valve Patent taken out, 1904.	7 21	4 8
17	F	*St. Hugh.*	7 22	4 7
18	S	Sir Stanley Maude died, 1917.	7 24	4 6
19	**S**	**23rd Sunday after Trinity** Ferdinand de Lesseps born, 1805; died December 7th, 1894.	7 26	4 4
20	M	*St. Edmund.* Tolstoi died, 1910.	7 27	4 3
21	T		7 29	4 2
22	W	*St. Cecilia.*	7 31	4 1
23	Th	*St. Clement.*	7 32	4 0
24	F	Faraday's discovery of magneto-electricity announced to Royal Society, 1831.	7 34	3 59
25	S	Sir Isaac Newton born, 1642; died March 20th, 1727.	7 36	3 58
26	**S**	**24th Sunday after Trinity**	7 37	3 57
27	M	Wm. Cowper, poet, born, 1731; died April 25th, 1800.	7 39	3 56
28	T		7 40	3 55
29	W	Dr. J. A. Fleming born, 1849.	7 42	3 54
30	Th	*St. Andrew.*	7 43	3 54

DECEMBER, 1922

PHASES OF THE MOON.

			h. m.				h. m.
Dec. 4	○	Full Moon	11 24	Dec. 11	●	New Moon	12 20
11	☾	*Last Quarter*	16 41	26	☽	*First Quarter*	5 53

			SUN. Rises. h. m.	SUN. Sets. h. m.
1	F	Queen Alexandra born, 1844.	7 45	3 53
2	S	Austerlitz, 1805. Fall of Monastir, 1915.	7 46	3 52
3	S	**Advent Sunday** Thomas Carlyle born, 1795.	7 47	3 52
4	M	R. L. Stevenson died, 1894; born, November 13th, 1850.	7 49	3 51
5	T	Admiral Jellicoe born, 1859.	7 50	3 51
6	W	*St. Nicholas.* Germans captured Bucarest, 1916.	7 51	3 50
7	Th		7 53	3 50
8	F	Falkland Islands Battle, 1914.	7 54	3 50
9	S	Jerusalem occupied by British, 1917.	7 55	3 49
10	S	**2nd Sunday in Advent** Capt. Ross Smith completed aeroplane flight from London to Australia, 1919.	7 56	3 49
11	M		7 57	3 49
12	T	First Transatlantic wireless message, 1901.	7 58	3 49
13	W	*St. Lucy.* Dr. Samuel Johnson died, 1784.	7 59	3 49
14	Th	George Washington died, 1799; born February 22nd, 1732.	8 0	3 49
15	F		8 1	3 49
16	S	Amundsen reached the South Pole, 1911.	8 2	3 49
17	S	**3rd Sunday in Advent** Lord Kelvin died, 1907.	8 3	3 49
18	M	Sir J. J. Thomson born, 1856.	8 3	3 50
19	T	Slavery abolished in U.S.A., 1862.	8 4	3 50
20	W		8 5	3 50
21	Th	*St. Thomas.* MICHAELMAS LAW SITTINGS END.	8 5	3 51
22	F	Winter Solstice.	8 6	3 51
23	S		8 6	3 52
24	S	**4th Sunday in Advent** James Prescott Joule born, 1818.	8 7	3 52
25	M	**Christmas Day**	8 7	3 53
26	T	*St. Stephen.* BOXING DAY.	8 7	3 54
27	W	*St. John.*	8 8	3 55
28	Th	*Holy Innocents.*	8 8	3 55
29	F	W. E. Gladstone born, 1809, died May 19th, 1898.	8 8	3 56
30	S	H.M.T. *Aragon* sunk, 1917.	8 8	3 57
31	S	**1st Sunday after Christmas** *St. Silvester.*	8 8	3 58

JEWISH CALENDAR
(A.D. 1922—A.M. 5682-5683)

The year of the Jewish Era began on October 3rd, 1921. The year 5683 will begin on September 23rd, 1922.

A.D. 1922		A.M. 5682	A.D. 1922		A.M. 5682
*Jan. 1	New Moon	Tebet 1	July 26	New Moon	Ab 1
„ 10	Fast	„ 10	Aug. 3	Fast of Ab	„ 9
„ 30	New Moon	Shebat 1	* „ 25	New Moon	Elul 1
					A.M. 5683
*Mar. 1	New Moon	Adar 1	Sept. 23	New Year	Tishri 1
„ 14	Purim	„ 14	„ 25	Fast	„ 3
„ 30	New Moon	Nisan 1	Oct. 2	Atonement	„ 10
April 13	Passover	„ 15	„ 7	Tabernacles	„ 15
* „ 26	New Moon	Iyar 1	„ 14	8th Day	„ 22
May 16	Lagbaomer	„ 18	* „ 23	New Moon	Heshvan 1
„ 28	New Moon	Sivan 1	Nov. 21	New Moon	Kislev 1
June 2	Pentecost	„ 6	Dec. 15	Hanukah	„ 25
* „ 27	New Moon	Tammuz 1	„ 20	New Moon	Tebet 1
July 13	Fast	„ 17	„ 29	Fast	„ 10

NOTE.—All the Jewish Sabbaths and Festivals begin at Sunset on the previous evening.

* Second day of New Moon.

MOHAMMEDAN CALENDAR
(Year 1340—1341)

The Mohammedan Epoch is the Hjira (Flight of Mohammed) from Mecca to Medina in 622 A.D. The Year 1340 began on September 4th, 1921, and the Year 1341 will begin on August 24th, 1922

Year.	Name of Month.	Month begins.	Year.	Name of Month.	Month begins.
		A.D. 1922			A.D. 1922
1340	Jomada II	January 30	1340	Dulheggia	July 26
„	Rajab	February 28	1341	Muharram	August 24
„	Shaaban	March 30	„	Saphar	September 23
„	Ramadan	April 28	„	Rabia I	October 22
„	Shawall	May 28	„	Rabia II	November 21
„	Dulkaada	June 26	„	Jomada I	December 20

BANK AND GENERAL HOLIDAYS

ENGLAND.—Good Friday, Easter Monday, Whit Monday, First Monday in August, Christmas Day and December 26th, or (if that date be Sunday) December 27th.

IRELAND.—Same as in England, with addition of St. Patrick's Day (March 17th) or Monday following if the 17th fall on Sunday.

SCOTLAND.—New Year's Day, Good Friday, First Monday in May, First Monday in August and Christmas Day. If Christmas Day or New Year's Day fall on Sunday the Monday following is the Bank Holiday.

QUARTER DAYS

ENGLISH.—Lady Day, March 25th; Midsummer, June 24th; Michaelmas, September 29th Christmas, December 25th.

SCOTCH.—Candlemas, February 2nd; Whitsun, May 15th; Lammas, August 1st; Martinmas, November 11th. The removal term days are—May 28th and November 28th. If a Scotch term, or quarter day, fall on Sunday, the Monday following is term day.

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES OF THE WORLD

ALGERIA.
* January 1.
Easter Monday.
Ascension Day.
Whit Monday.
* Fete Nationale, July 14.
Assumption, August 15.
All Saints' Day, November 1.
* Christmas Day, December 25.
* If these days fall two days before or after Sunday, the intervening day is a Customs holiday.

ARGENTINA.
January 1 and 6.
February 6, 7 and 8.
March 19.
Maundy Thursday.
Good Friday.
Easter Saturday.
Easter Sunday.
Ascension Day.
May 25 and 26.
June 29.
July 9.
August 15 and 30.
October 12 (Buenos Aires only).
November 1 and 11.
December 8 and 25.

AUSTRALIA.
New Year's Day.
Good Friday.
Easter Saturday and Monday, and Banks and Offices Tuesday also. (Tuesday is not observed in New South Wales.)
King's Birthday.
Prince of Wales's Birthday.
Christmas Day.
Boxing Day.
Eight-Hour Day (different day in each State; day celebrating the granting of an eight-hour working day in those States where the principle is legalised). New South Wales—First Monday in October. Queensland—1st May.
Each of the States has also a holiday known as Anniversary Day, to celebrate its foundation. In each State there are holidays, annual and declared, with regard to local events and anniversaries.
In New South Wales January 26 (Anniversary Day) and first Monday in August are also holidays.
In Victoria there are also local holidays: Foundation Day (January 26); Eight-Hour Day (April 23); and in Melbourne and vicinity, Melbourne Cup Day (first Tuesday in November), and Picnic Day.
In Western Australia, Anniversary Day (June 1) and the Monday following October 26 are also holidays; also one day in March (Lumpers' Picnic Day).
In South Australia, at Port Adelaide, the following are observed as holidays as announced in Government Gazette: New Year's Day (January 1); Foundation Day (January 31); Good Friday; Easter Monday; King's Accession (May 6); King's Birthday (June 6); Prince of Wales's Birthday (June 27); Eight-Hour Day (October 8); Christmas Day (December 25); Proclamation Day (December 28); Anniversary of the State.

BARBADOS.
January 1st (if on Sunday, Monday is the holiday: if the mail arrive on holiday, the following Monday is the holiday), Good Friday, Easter Monday (if the mail arrive or leave on this day, the following Monday is the holiday), Whit Monday, May 24th (Empire Day), first Monday in August, August 11th (Thanksgiving Day), first Monday in October, December 25th (Christmas Day), December 26th (Boxing Day) (if on Sunday, Monday is the holiday).

BELGIUM.
New Year's Day.
Shrove Monday and Tuesday.
Easter Monday.
Ascension Day.
Whit Monday.
July 21 (National Fête).
August 4.
August 15, Assumption.
November 1, All Saints' Day
November 2, All Souls' Day.
December 25, Christmas Day
December 26.
In July at Ghent, and in August at Antwerp, there are also two days' local holidays (Kermesse), generally Monday and Tuesday.

BERMUDA.
Good Friday, May 24th (Empire Day), December 25th (Christmas Day), December 26th (Boxing Day).

BRAZIL.
January 1, 6.
February 24.
April 21.
May 1, 3 and 13.
June 29.
July 14.
August 15.
September 7.
October 12.
November 1, 2 and 15.
December 8 and 25.
Easter (Good Friday and Monday) and Carnival—(seven weeks previous) (Monday, Tuesday and Wednesday).
Ascension Day.
Corpus Christi.
Various other holidays of a local nature are observed in the different States.
January 20 and September 20 are Federal District holidays.

BRITISH GUIANA.
Easter Monday, Whit Monday, first Monday in August, December 26 (Boxing Day) (if on Sunday, Monday is the holiday).

CANADA.
New Year's Day. January 6, Epiphany.* Good Friday. Ascension Day.* All Saints' Day.* Conception Day.* Easter Monday. Christmas Day.
* These holidays are observed only in the Province of Quebec.

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES OF THE WORLD—*continued.*

CANADA—*continued.*
Empire Day (May 24).
July 1, Dominion Day.
First Monday in September (Labour Day).
King's Birthday, June 3, and any day proclaimed as a general Fast or Thanksgiving.

CHILE.
January 1. Good Friday and Saturday. Ascension Day. May 21 (National Feast). Corpus Christi. June 29. August 14. September 18 and 19 (National Feast). November 1. December 8 and 25.

CHINA (HONG-KONG).
New Year's Day.
Chinese New Year.
Good Friday.
Saturday before Easter
Easter Monday.
Whit Monday.
King's Birthday.
July 1.
First Monday in August, second Monday in October and November.
Empire Day.
Christmas Day.
December 26.

CHINA (SHANGHAI).
New Year (January 1 and 2).
Chinese New Year (4 days, February 1-4).
Easter (3 days).
Whitsuntide (1 day).
October 10 (Anniversary of Republic).
Christmas (December 25 and 26).
In addition, the Banks keep the following holidays:—Dragon Boat Festival (June), Midsummer (July 1 and 2), Autumn (First Monday in August), and Mid-Autumn Festival, Chinese (September).
The Customs usually observe New Year (3 days), Good Friday, Chinese New Year, Dragon Boat and Mid-Autumn Festivals, Anniversary (Oct. 11), Proclamation (Feb. 12) of Republic, December 22 and Christmas Day.

COCHIN CHINA (FRENCH).
New Year's Day. Chinese New Year Festival. Easter Monday. Ascension Day. Whit Monday. July 14. Assumption (August 15). October 10. All Saints' Day (November 1). All Souls' Day (November 2), and Christmas Day.
If January 1, July 14, August 15 or December 25 fall on Sunday, the following day is a legal holiday.

COLOMBIA.
January 1 and 6. Maundy Thursday. Good Friday. Ascension Day. St. Peter (June 29). July 20, Independence Day. August 7 and 15. October 12. All Saints' (November 1). December 8. Christmas Day.

COSTA RICA.
January 1.
Three days in Holy Week (Semana Santa).
May 1, Opening of Congress.
September 15, Independence Anniversary.
October 12, Columbus Day.
Christmas Day.

CUBA.
January 1.
February 24.
May 20.
October 10.
December 7.
December 25.
Good Friday is not a legal holiday, but is very strictly observed.

DENMARK.
New Year's Day. Easter (Thursday, Good Friday and Monday). April 22 (Prayers Day). Ascension Day. Whit Monday. June 5 (Constitution Day) after noon. Christmas Day and December 26, in addition to all Sundays.

ECUADOR.
January 1, New Year's Day.
Good Friday.
August 10 } Independence Days of Quito
October 9 } and Guayaquil.
December 25, Christmas Day.

EGYPT.
Sultan's Birthday (March 26).
Sham-El-Nissim.
The King's Accession Day (May 6).
The King's Birthday (June 3).
Ramadan Bairam.
Qurban Bairam.
Holy Carpet (variable).
Mohammedan New Year's Day.
Sultan's Accession Day (October 9).
Birthday of the Prophet (November 12).
Sundays are also observed.

ESTHONIA.
New Year's Day (January 1).
Epiphany (January 6).
Declaration of the Independence (Feb. 24)
Day of Prayer and Repentance.
Thursday before Good Friday.
Good Friday.
Easter Sunday, Monday and Tuesday.
May Day (May 1).
Ascension Day. Maundy Thursday.
Pentecost Sunday, Monday and Tuesday.
Midsummer Day (June 24).
Martinmas.
Christmas Sunday, Monday and Tuesday.

FINLAND.
January 1 and 6; March 25; Easter (Good Friday and Easter Monday); Ascension Day; June 24 (Midsummer Day); Christmas Day and December 26.

FRANCE.
New Year's Day. Easter. Ascension Day. Whitsuntide. French National Fête, July 14. Assumption, August 15. All Saints' Day. Christmas Day.

GERMANY.
New Year's Day.
Good Friday.
Easter Monday.
Ascension Day.
Whit Monday.
Third Wednesday in November (day of Fasting and Prayer).
December 25 and 26.

GREECE.
New Year's Day (January 14).
Epiphany (January 19).
Independence Day (April 7).

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES OF THE WORLD—*continued.*

GREECE—*continued.*
Good Friday.
Saturday before Easter.
Easter Monday.
St. George's Day (May 6).
Ascension.
Holy Ghost.
St. Peter (July 12).
Assumption (August 28).
St. Demetrius's Day (November 8).
Christmas, January 6, 7 and 8.
Dates given are new style.
The Shipping Community also observe S. Nicolas's Day and S. Spiridion's Day (December 19 and 25). Customs observe also Christmas Eve, S. Constantine's Day (June 3), S. Nicolas (December 19), S. Spiridion (December 25).

GUATEMALA.
January 1.
March 15.
Easter.
June 30.
September 15 (Independence Day).
October 28.
November 21.
December 25.

HAITI.
All Sundays, January 1 and 2, May 1.
Holy Thursday, Good Friday, Mardi Gras, Day of Pentecost, Fête Dieu, Petite Dieu (half-day afternoon), August 15, November 1 and 2, December 25.

HOLLAND.
New Year's Day, Easter Monday, Ascension Day, Whit Monday, Christmas Day and December 26.

HONDURAS (British).
The Birthday of the Sovereign.
The Birthday of the Heir to the Throne.
Victoria Day, May 24.
St. George's Caye Day, September 10.
New Year's Day.
Good Friday.
Christmas Day, December 25.

HONDURAS (Republic).
New Year's Day.
Holy Week and Independence Day (September 15).
Christmas Day.

INDIA.
New Year's Day, Easter (Friday to Monday), Emperor's Birthday. Christmastide (three days), and various Native Religious Festivals.

ITALY.
New Year's Day. Easter Sunday. Christmas Day. Epiphany. Ascension Day. June 24 (St. John the Baptist) (at Genoa). August 15, Assumption. September 20 (National Holiday). November 1, All Saints' Day, November 4, Victory Day.
At Civita Vecchia, April 28, S. Fermina is observed.

JAMAICA.
January 1, Ash Wednesday, Good Friday, Easter Monday. Whit Monday, May 24 (Empire Day), first Monday in August, December 25 (Christmas Day), December 26 (Boxing Day).

JAPAN.
January 1 and 2. January 3 and 5. February 11. March 22 (changeable). Good Friday. Easter Monday. April 3. July 30. First Monday in August (Summer Holiday). August 31. September 24 (changeable). October 17. October 31. November 23. Christmas Day. December 26. December 31.

LATVIA.
January 1 and 6. Thursday before Good Friday. Good Friday. Easter Monday. Easter Tuesday. May 1. Ascension Day. Whit Monday. Whit Tuesday. June 23 and 24. Independence Day (November 18). December 25, 26, 27.

LIBERIA.
New Year's Day (January 1); Pioneer's Day (January 7); Decoration Day (March 12); Good Friday (April 2); National Fast Day (April 11); Independence Day (July 26); National Flag Day (August 24); Thanksgiving Day (November 6); Newport Day (December 1) Christmas Day (December 25).

MEXICO.
New Year's Day. Epiphany (January 6). Constitution Day (February 5). Thursday before Easter. Good Friday. St. Joseph (March 19). May 5. Ascension Day. Corpus Christi. Assumption (August 15). September 16. All Saints' Day (November 1). All Souls' Day (November 2). Conception Day (December 8). December 12. Christmas Day.

MOROCCO.
January 7 (Aid Seghir). August 14 (Aid el-Kebir). September 13 (Ashora). November 13 (Mouloud) two days.

NEW ZEALAND (Dunedin).
January 1 and 2. Anniversary of the Founding of the Province of Otago (March 23). Good Friday. Easter Monday. Anzac Day (April 25). Empire Day (May 24). King's Birthday (June 3). Arbor Day (date in August fixed by Education Board). Labour Day (fourth Monday in October). St. Andrew's Day (November 30). Christmas Day (December 25). Boxing Day (December 26).

NEW ZEALAND (Wellington).
New Year's Day. St. Patrick's Day (March 17). Good Friday. Day after Good Friday. Easter Monday. St. George's Day (April 23). The Sovereign's Birthday (June 3). Dominion Day (4th Monday in September). Labour Day (4th Monday in October). St. Andrew's Day (November 30). Christmas Day. Day after Christmas Day.

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES OF THE WORLD—*continued.*

NICARAGUA.
January 1, July 4 and 14, Holy Thursday, Good Friday, September 14 and 15, October 12, December 25.

NORWAY.
New Year's Day. Maundy Thursday. Easter Day and Easter Monday. May 17 (half-holiday). Ascension Day. Whit Sunday. Whit Monday. Pray Day, November 4. Christmas Day and December 26.

PANAMA (Canal Zone).
New Year's Day. Washington's Birthday (February 22). Good Friday. Decoration Day (May 30). U.S. Independence Day (July 4). Labour Day, First Monday in September. Panama Independence Day (November 3). Thanksgiving Day (last Thursday in November). Christmas Day.
If a legal holiday fall on a Sunday, the Monday following will be observed as a legal holiday.

PANAMA (Republic of).
January 1, New Year's Day. January 21, Foundation of the City of Panama. February 15, Signing of the Act of Independence of Panama. Shrove Tuesday, "Martes del Carnaval." Holy Thursday. Good Friday. May 1, Labour Day. July 4, Independence of the United States. July 24, Birthday of Simon Bolivar. October 1, every fourth year—Inauguration of the New President (half-day). October 12, Discovery of America. November 3, Independence of Panama from Colombia. November 28, Independence from Spain. December 25, Christmas Day.

PARAGUAY.
January 1, February 3. May 14 and 15. August 15. October 12. November 25. December 8 and 25.

PERU.
January 1 and 6. Shrove Monday and Tuesday. Ash Wednesday (half-day). March 19 (St. Joseph). Thursday and Friday before Easter. Ascension Day. Corpus Christi (movable). June 29. July 28, 29 and 30. August 15 and 30. September 24. October 12. November 1. December 8 and 25.

PORTO RICO.
New Year's Day. February 22 (Washington's Birthday). March 22 (Abolition of Slavery). Good Friday. May 30 (Decoration Day). July 4 (Declaration of Independence). July 25 (Day of Landing of Americans). First Monday in September (Labour Day). October 12 (Columbus Day). Last Thursday in November (Thanksgiving Day). December 25 (Christmas Day).

PORTUGAL (Lisbon).
January 1 and 31.
May 3.
June 10.
October 5.
December 1 and 25

RUMANIA.
January 7, 8 and 9 (Christmas Holidays). January 14 (New Year's Day). January 19 (Epiphany). January 20 (St. John the Baptist). February 6, National Holiday (Union of Principalities). February 15 (Purification). March 27 (Proclamation of Rumania as a Kingdom). April 7 (Annunciation Day). Easter Monday and Tuesday (Greek). May 6 (St. George's Day). May 23 (King's Coronation). Ascension Day (Greek). June 3 (SS. Constantine and Helen). Whit Monday (Greek). July 12 (SS. Peter and Paul). August 2 (St. Elias). August 19 (Transfiguration). August 28 (Assumption Day). September 11 (Death of St. John the Baptist). September 21 (Nativity of B.V.M.). September 27 (Exaltation of the Cross). November 8 (St. Demetrius). November 21 (SS. Michael and Gabriel). December 4 (Presentation). December 19 (St. Nicholas).
Dates given are New Style.

RUSSIA.
January 7 (Christmas Day). January 8 (2nd Christmas Day). January 9 (3rd Christmas Day). January 14 (New Year's Day). January 19 (Epiphany). February 15 (Purification). Carnival Day. Carnival Second Day. April 7 (Annunciation of Blessed Virgin Mary). Palm Sunday. Thursday before Good Friday. Good Friday. Easter Saturday. Easter Monday. Easter Tuesday. Easter Wednesday. Easter 6th Day. May 22, St. Nicholas's Day. Ascension Day. June 8, Holy Ghost Day. Whit Monday. July 12, St. Peter and St. Paul. August 19, Transfiguration. August 28, Assumption Blessed Virgin Mary. September 11, Death of St. John the Baptist. September 12, St. Alexander Nevsky. September 21, Nativity of Blessed Virgin Mary. September 27, Exaltation of Cross. October 9, St. John the Evangelist. October 14, Intercession of Blessed Virgin Mary. November 4, Virgin of Kazan. December 4, Presentation of Blessed Virgin Mary.
Dates given are New Style.

SALVADOR.
January 1 and 6. March 1 and 15. Wednesday, Thursday, Friday and Saturday in Holy Week. Ascension Day. June 22 and 29. July 14. August 5 and 6. September 15 (Independence Day). October 12, November 1 (All Saints') and November 5. December 8, 24 and 25.

SANTO DOMINGO.
New Year's Day.
January 6.
Independence Day (February 27
Corpus Christi.
August 16 (Spanish evacuation).
Las Mercedes (September 24).
Holy Week (Thursday and Friday).
Christmas Day.

SIAM.
King's Birthday (January 1).
New Year's Day (January 1).
Chinese New Year (two days).

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES OF THE WORLD—*continued.*

SIAM—*continued.*
- Siamese New Year (April 1).
- Easter (Friday to Monday).
- May 24, June 9, July 1, July 14, August 4.
- Memorial Day of King Rama V. (October 23).
- Accession Day (November 11).
- Christmas Day.
- December 26.

SOUTH AFRICA.
- New Year's Day.
- Good Friday.
- Easter Monday.
- Empire Day (May 24).
- Union Day (May 31).
- Ascension Day.
- First Monday in August.
- First Monday in October.
- Dingaan's Day (December 16).
- Christmas Day.
- Boxing Day.

SPAIN.

January 1, Circumcision. January 6, Twelfth Night. March 19, St. Joseph. Holy Thursday. Good Friday. Ascension Day. June 3, Corpus Christi. June 29, SS. Peter and Paul. July 25, St. James. August 15, Assumption. November 1, All Saints' Day. December 8, Immaculate Conception. December 25, Christmas Day.

STRAITS SETTLEMENTS.
- New Year's Day.
- Chinese New Year (two days).
- Taipusum (January 24).
- Easter (three days).
- Whit Monday.
- King's Birthday.
- Hari Raya Puaba (June 8).
- July 30.
- First Monday in August.
- November 12 and 14.
- Christmas (two days).

These days are usually holidays, the following Monday being observed if any fall on Sunday.

At Singapore (February 6) and Penang (August 12) the Anniversaries of the Settlements are also observed as holidays.

SWEDEN.
- January 1. January 6.
- Annunciation (March 25).
- Good Friday.
- Day before Easter Holidays.
- Easter Monday.
- May 1.
- Ascension Day.
- Day before Whit Sunday.
- Whit Monday.
- June 23 and 24.
- December 24, 25, 26 and 31.

TASMANIA.
- January 1, New Year's Day.
- January 26 (Foundation of Australia Anniversary).
- Eight-Hour Day.
- Good Friday.
- Easter Monday.
- The King's Birthday (June 3).
- Prince of Wales's Birthday (June 23).
- Day of Wharf Labourers' Union Picnic.
- Christmas Day, December 25.
- December 26.

When Anniversary Day or King's Birthday falls on any day but Monday, the following Monday is observed instead, and whenever Christmas Day falls on Sunday the two days following are Bank Holidays. When any other holiday falls on Sunday the following Monday is a Bank Holiday.

TRINIDAD.

January 1. Good Friday. Easter Monday. Whit Monday. May 24 (Empire Day). Corpus Christi. July 31. Discovery Day. December 25 (Christmas Day).

TRIPOLI (BARBARY).
- New Year's Day.
- Epiphany (January 6).
- Ascension Day (May 29).
- August 15.
- September 20.
- All Saints' Day (November 1).
- Christmas Day.

TURKEY.
- January 1, New Year's Day, N.S.
- January 7, Christmas Day, O.S.
- January 14, New Year's Day, O.S
- January 19, Epiphany, O.S.
- July 23, National Holiday.
- August 15, Assumption, N.S.
- August 28, Assumption, O.S.
- November 1, All Saints' Day, N.S.
- December 25, Christmas Day.
- Bairam (one day).
- Good Friday, N.S.
- Easter Monday, N.S.
- Holy Thursday, O.S.
- Easter Monday, O.S.
- Ascension, N.S. Ascension, O.S.
- Pentecost, N.S. Pentecost, O.S.
- Rosess (Jewish New Year's Day).
- Pessah (Jewish Easter).
- Kifour (Fête du Pardon).
- Mevloud (Birthday of Mahomet).
- Holy Gregory (Armenian Holiday).
- Mahomet's Birthday.
- Sheker-Bairam (3 days).
- Courban-Bairam (4 days).

TURK'S ISLAND.

January 1. Good Friday. December 25 (Christmas Day).

UNITED STATES OF AMERICA.
- January 1. New Year's Day: In all States and District of Columbia, Porto Rico, Hawaii, and Alaska, except Massachusetts.
- January 8. Anniversary of the Battle of New Orleans: In Louisiana.
- January 19. Lee's Birthday: In Alabama, Arkansas, Florida, Georgia, North Carolina, South Carolina, and Virginia.
- February 12. Georgia Day: In Georgia.
- February 12. Lincoln's Birthday: In California, Colorado, Connecticut, Delaware, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Montana, Nebraska, Nevada, New Jersey, New York, North Dakota, Oregon, Pennsylvania, South Dakota, Washington, West Virginia, and Wyoming.

LIST OF OFFICIAL HOLIDAYS IN VARIOUS COUNTRIES OF THE WORLD—*continued.*

UNITED STATES OF AMERICA—*continued.*

February 14. Admission Day: In Arizona.
February 17. Mardi Gras, Shrove Tuesday: In Alabama and Florida (in counties having a carnival): in Louisiana, in the parishes of Orleans, St. Bernard, Jefferson, St. Charles, and St. John the Baptist.
February 22. Washington's Birthday: In all the States, District of Columbia, Porto Rico, Hawaii, and Alaska.
March 2. Anniversary of Texan Independence: In Texas.
March 4. Inauguration Day: In District of Columbia in years when a President of the United States is inaugurated.
March 22. Emancipation Day: In Porto Rico.
March 25. Maryland Day: In Maryland.
April 2. Good Friday: In Alabama, Connecticut, Delaware, Florida, Louisiana, Maryland, Minnesota, New Jersey, Pennsylvania, Porto Rico, Tennessee.
April 12. Halifax Independence Resolutions: In North Carolina.
April 13. Thomas Jefferson's Birthday: In Alabama.
April 19. Patriots' Day: In Maine and Massachusetts.
April 21. Anniversary of the Battle of San Jacinto: In Texas.
April 26. Confederate Memorial Day: In Alabama, Florida, Georgia, and Mississippi.
May 10. Confederate Memorial Day: In North Carolina and South Carolina.
May (Second Friday). Confederate Day: In Tennessee.
May 20. Anniversary of the Signing of the Mecklenburg Declaration of Independence: In North Carolina.
May 30. Decoration Day: In all the States and District of Columbia, Porto Rico, Hawaii, and Alaska, except Arkansas, Florida, Louisiana, Mississippi North Carolina, South Carolina, and Texas. Confederate Memorial Day: In Virginia.
June 3. Jefferson Davis's Birthday: In Alabama, Florida, Georgia, Mississippi, South Carolina, and Texas. In Louisiana, known as "Confederate Memorial Day."
June 11. Kamehameha Day: In Hawaii.
June 15. Pioneer Day: In Idaho.
July 4. Independence Day: In all the States, and District of Columbia, Porto Rico, Hawaii, and Alaska.
July 24. Pioneers' Day: In Utah.
July 25. Landing of American Troops: Porto Rico.
August 1. Colorado Day: In Colorado.
August 16. Bennington Battle Day: In Vermont.
September 3. Labour Day: In all the States and District of Columbia, Porto Rico, Hawaii and Alaska.
September (Third Saturday). Regatta Day: In Territory of Hawaii.
September 9. Admission Day: In California.
September 12. "Defenders' Day": In Maryland.
October (First Monday): Missouri Day (commemorative of Missouri history) In Missouri.
October (Second Friday). Farmers' Day: In Florida.
October 12. Columbus Day: In Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Idaho, Illinois, Indiana, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Porto Rico, Rhode Island, Texas, Vermont, Washington, West Virginia.
October 18. Alaska Day: In Alaska.
October 31. Admission Day: In Nevada.
November 1. All Saints' Day: In Louisiana.
November 6. General Election Day: In most of the States.
November (usually the last Thursday). Thanksgiving Day: Is observed in all the States and in the District of Columbia, Porto Rico, Hawaii, and Alaska, although it is not a statutory holiday in all.
December 25. Christmas Day: In all the States and the District of Columbia, Porto Rico, Hawaii and Alaska.
Arbor Day: In some of the States. The date is not uniform.
Saturday Afternoon: In many of the States and cities and District of Columbia.
Sundays and Fast days are legal holidays in all the States which designate them as such.
There is no National holiday, not even the Fourth of July. Congress has at various times appointed special holidays. In the second session of the Fifty-third Congress it passed an Act making Labour Day a public holiday in the District of Columbia, and it has recognised the existence of certain days as holidays for commercial purposes; but, with the exception named, there is no general statute on the subject. The proclamation of the President designating a day of Thanksgiving only makes it a legal holiday in the District of Columbia and the Territories.

URUGUAY.

January 1 and 6. February 3 and 28. April 19. May 1, 18 and 25. June 29. July 4, 14 and 18. August 15 and 25. September 20. October 12. November 1. December 8 and 25. Also Monday and Tuesday preceding Ash Wednesday (Carnival). and Thursday, Friday and Saturday in Holy Week.

VENEZUELA.

January 1.
Holy Thursday and Good Friday.
April 19.
July 5.
July 24.

1921 CALENDAR 1921

JANUARY						
S	—	2	9	16	23	30
M	—	3	10	17	24	31
T	—	4	11	18	25	—
W	—	5	12	19	26	—
T	—	6	13	20	27	—
F	—	7	14	21	28	—
S	1	8	15	22	29	—

FEBRUARY					
S	—	6	13	20	27
M	—	7	14	21	28
T	1	8	15	22	—
W	2	9	16	23	—
T	3	10	17	24	—
F	4	11	18	25	—
S	5	12	19	26	—

MARCH					
S	—	6	13	20	27
M	—	7	14	21	28
T	1	8	15	22	29
W	2	9	16	23	30
T	3	10	17	24	31
F	4	11	18	25	—
S	5	12	19	26	—

APRIL					
S	—	3	10	17	24
M	—	4	11	18	25
T	—	5	12	19	26
W	—	6	13	20	27
T	—	7	14	21	28
F	1	8	15	22	29
S	2	9	16	23	30

MAY					
S	1	8	15	22	29
M	2	9	16	23	30
T	3	10	17	24	31
W	4	11	18	25	—
T	5	12	19	26	—
F	6	13	20	27	—
S	7	14	21	28	—

JUNE					
S	—	5	12	19	26
M	—	6	13	20	27
T	—	7	14	21	28
W	1	8	15	22	29
T	2	9	16	23	30
F	3	10	17	24	..
S	4	11	18	25	—

JULY						
S	—	3	10	17	24	31
M	—	4	11	18	25	—
T	—	5	12	19	26	—
W	—	6	13	20	27	—
T	—	7	14	21	28	—
F	1	8	15	22	29	—
S	2	9	16	23	30	—

AUGUST					
S	—	7	14	21	28
M	1	8	15	22	29
T	2	9	16	23	30
W	3	10	17	24	31
T	4	11	18	25	—
F	5	12	19	26	—
S	6	13	20	27	—

SEPTEMBER					
S	—	4	11	18	25
M	—	5	12	19	26
T	—	6	13	20	27
W	—	7	14	21	28
T	1	8	15	22	29
F	2	9	16	23	30
S	3	10	17	24	—

OCTOBER						
S	—	2	9	16	23	30
M	—	3	10	17	24	31
T	—	4	11	18	25	—
W	—	5	12	19	26	—
T	—	6	13	20	27	—
F	—	7	14	21	28	—
S	1	8	15	22	29	—

NOVEMBER					
S	—	6	13	20	27
M	—	7	14	21	28
T	1	8	15	22	29
W	2	9	16	23	30
T	3	10	17	24	—
F	4	11	18	25	—
S	5	12	19	26	—

DECEMBER					
S	—	4	11	18	25
M	—	5	12	19	26
T	—	6	13	20	27
W	—	7	14	21	28
T	1	8	15	22	29
F	2	9	16	23	30
S	3	10	17	24	31

1923 CALENDAR 1923

JANUARY					
S	—	7	14	21	28
M	1	8	15	22	29
T	2	9	16	23	30
W	3	10	17	24	31
T	4	11	18	25	—
F	5	12	19	26	—
S	6	13	20	27	—

FEBRUARY					
S	—	4	11	18	25
M	—	5	12	19	26
T	—	6	13	20	27
W	—	7	14	21	28
T	1	8	15	22	—
F	2	9	16	23	—
S	3	10	17	24	—

MARCH					
S	—	4	11	18	25
M	—	5	12	19	26
T	—	6	13	20	27
W	—	7	14	21	28
T	1	8	15	22	29
F	2	9	16	23	30
S	3	10	17	24	31

APRIL					
S	1	8	15	22	29
M	2	9	16	23	30
T	3	10	17	24	—
W	4	11	18	25	—
T	5	12	19	26	—
F	6	13	20	27	—
S	7	14	21	28	—

MAY					
S	—	6	13	20	27
M	—	7	14	21	28
T	1	8	15	22	29
W	2	9	16	23	30
T	3	10	17	24	31
F	4	11	18	25	—
S	5	12	19	26	—

JUNE					
S	—	3	10	17	24
M	—	4	11	18	25
T	—	5	12	19	26
W	—	6	13	20	27
T	—	7	14	21	28
F	1	8	15	22	29
S	2	9	16	23	30

JULY					
S	1	8	15	22	29
M	2	9	16	23	30
T	3	10	17	24	31
W	4	11	18	25	—
T	5	12	19	26	—
F	6	13	20	27	—
S	7	14	21	28	—

AUGUST					
S	—	5	12	19	26
M	—	6	13	20	27
T	—	7	14	21	28
W	1	8	15	22	29
T	2	9	16	23	30
F	3	10	17	24	31
S	4	11	18	25	

SEPTEMBER						
S	—	2	9	16	23	30
M	—	3	10	17	24	—
T	—	4	11	18	25	—
W	—	5	12	19	26	—
T	—	6	13	20	27	—
F	—	7	14	21	28	—
S	1	8	15	22	29	—

OCTOBER					
S	—	7	14	21	28
M	1	8	15	22	29
T	2	9	16	23	30
W	3	10	17	24	31
T	4	11	18	25	—
F	5	12	19	26	—
S	6	13	20	27	—

NOVEMBER					
S	—	4	11	18	25
M	—	5	12	19	26
T	—	6	13	20	27
W	—	7	14	21	28
T	1	8	15	22	29
F	2	9	16	23	30
S	3	10	17	24	—

DECEMBER						
S	—	2	9	16	23	30
M	—	3	10	17	24	31
T	—	4	11	18	25	—
W	—	5	12	19	26	—
T	—	6	13	20	27	—
F	—	7	14	21	28	—
S	1	8	15	22	29	—

RECORD OF WIRELESS DEVELOPMENT

Years 1827—1921 inclusive.

RECORD OF THE DEVELOPMENT OF WIRELESS TELEGRAPHY AND TELEPHONY, AND INTERESTING ITEMS IN CONNECTION THEREWITH

The record below is intended to constitute a résumé, arranged in chronological order, of the outstanding events in wireless telegraphy from year to year.

This is a feature which has figured in our Year-Book *from its initiation in* 1913. *The record for the past year will be found in an extended form at the end of this section.*

1827.

SAVARY found that a steel needle could be magnetised by the discharge from a leyden-jar.

1831.

Michael Faraday discovered electro-magnetic induction between two entirely separate circuits.

1837.

The first patent for an electric telegraph was taken out by Cooke and Wheatstone (London) and by Morse (U.S.A.).

1838.

K. A. Steinheil (Munich) discovered the use of the earth return, and suggested that the remaining metallic portion of the circuit might be dispensed with entirely, and a system of wireless telegraphy established.

1840.

Joseph Henry (U.S.A.) first produced high-frequency electric oscillations, and pointed out that the discharge of a condenser is oscillatory.

1842.

S. F. B. Morse made wireless experiments by electric conduction through water across Washington Canal and across wide rivers.

Joseph Henry noticed that the effect of a single electric spark about one inch long occurring in a circuit in an upper room was to magnetise steel needles included in another circuit placed in a cellar thirty feet below with two floors intervening. He was one of many observers prior to Hertz who had noticed curious effects due to electric sparks produced at a distance, which were commonly ascribed to ordinary electro-magnetic induction.

1843.

James Bowman Lindsay, of Dundee, suggested that if it were possible to provide stations not more than twenty miles apart all the way across the Atlantic, there would be no need to lay any cable.

1845.

Lindsay began making experiments across the River Tay, his method being to transmit messages by means of electricity or magnetism through and across the water without submerged wires, the water being utilised as the conducting medium.

1849.

Dr. O'Shaughnessy (afterwards Sir William O'Shaughnessy) Brooke succeeded in passing intelligible signals without any metallic conduction across the River Hooghly, 4,200 ft. wide, in India, but he found the cost of power prohibitive.

1853.

Lord Kelvin published a classical paper entitled "On Transient Electric Currents," in which the discharge of a Leyden jar was mathematically treated.

1859.

Bowman Lindsay gave a demonstration of his conduction system to the British Association Meeting, at which Michael Faraday and Sir William Thomson (afterwards Lord Kelvin) were both present. William H. Preece (afterwards Sir William) was deputed by the Electric Telegraph Company to report on Lindsay's system.

1862.

John Heyworth patented a method of conveying electric signals without the intervention of any continuous artificial conductor. Cromwell Varley tried this method, but found it a failure.

1867.

James Clerk Maxwell read a paper before the Royal Society, in which he laid down the theory of electro-magnetism, which he developed more fully in 1873, in his great treatise on electricity and magnetism. He predicted the existence of the electric waves that are now used in wireless telegraphy.

1870.

Von Bezold discovered that oscillations set up by a condenser discharge in a conductor give rise to interference phenomena.

1872.

Henry Highton made various experiments across the River Thames with Morse's method.

1876.

Dr. Alexander Graham Bell patented the earliest forms of his telephone receiver.

1878.

David E. Hughes described his microphonic tube containing metal filings—subsequently called a "coherer"—in a paper to the Royal Society in May.

1879.

David E. Hughes discovered the phenomena on which depend the action of what was subsequently known as the coherer. These phenomena many years later were used in early electric-wave signalling. He found that a tube of metallic filings was sensitive to electric sparks made in its vicinity, and he was able to obtain such effects on a tube connected to a battery and a telephone at a distance of five hundred yards.

1880.

John Trowbridge, of Harvard, systematically studied the problem of propagation of electric current through "earth," either soil or water, and he found that signalling might be carried on over considerable distances by electric conduction through the earth or water between places not metallically connected.

1882.

Graham Bell experimented with Trowbridge's method on the Potomac River, when signals were detected at a distance of 1½ miles.

Sir William H. Preece made an experiment, using Morse's method, to connect the Isle of Wight with the mainland across the Solent on two occasions during the failure of the submarine cable in the Solent.

A. E. Dolbear of Boston, U.S.A., applied for a patent for a method of electrostatic wireless signalling, which patent was granted in 1886.

1883.

Willoughby Smith, in a paper before the Institution of Civil Engineers, London, suggested that electric induction might be employed for railway signalling.

Heinrich Rudolph Hertz became *privat docent* at Kiel, where he began studies in Maxwell's electro-magnetic theory.

G. F. Fitzgerald suggested a method of producing electro-magnetic waves in space by the discharge of a condenser.

Thomas A. Edison discovered the emission of charged particles from a hot carbon filament, a phenomenon now usually termed the "Edison Effect."

1885.

Thomas A. Edison, with the assistance of Messrs. Gilliland, Phelps, and W. Smith, worked out a system of communication between railway stations and moving trains by means of induction and without the use of conducting wires.

Sir W. H. Preece made experiments at Newcastle-on-Tyne which showed that in two completely insulated circuits of square form, each side being 440 yards, placed a quarter of a mile apart, telephonic speech was conveyed from one to the other by induction. He also read a paper before the Royal Society describing experiments on the "Edison Effect."

1886.

A. E. Dolbear, of Tuft's College, Boston, patented a plan for establishing wireless communication by means of two insulated elevated plates, but there is no evidence that the method proposed by him did, or could, effect the transmission of signals between stations separated by any distance.

1887.

Heinrich Rudolph Hertz discovered the progressive propagation of electro-magnetic action through space, and was able to measure the length and velocity of electro-magnetic waves, and to show that in the transverse nature of their vibration, and their susceptibility to refraction and polarisation, they are in complete accordance with the waves of light and heat.

Hertz employed as a detector of the electric wave a simple nearly closed circuit of wire, called the "Hertz Resonator" but it was subsequently discovered that the metallic microphone of Hughes was a far more sensitive detector.

A. W. Heaviside established communication by telephonic speech between the surface of the earth and the subterranean galleries of the Broomhill Collieries, 350 ft. deep, by laying above and below ground two complete metallic circuits, each about 2½ miles in length, and parallel to each other.

1889.

Elihu Thompson suggested that electric waves were particularly suitable for the transmission of signals through fogs and material objects.

O. Lodge observed a "coherer" action between two metal balls.

1890.

Prof. J. A. Fleming described some extensive experiments on the "Edison Effect" in glow lamps.

1891.

John Trowbridge suggested that by means of magnetic induction between two separate and completely insulated circuits communication could be effected over considerable distances.

1892.

Edouard Branly devised an appliance for detecting electro-magnetic waves, which was known as a "coherer." He discovered that these waves had the power of affecting the electric conductivity of materials when in the state of a powder.

Sir W. H. Preece adopted a method which united both conduction and induction as the means of affecting one circuit by the current in another. In this way he established communication between two points on the Bristol Channel, and at Lochness, in Scotland.

C. A. Stevenson, of the Northern Lighthouse Board, Edinburgh, advocated the use of an inductive system for communication between the mainland and isolated lighthouses.

1894.

E. Rathenau, of Berlin, experimented with a conductive system of wireless telegraphy, and signalled through three miles of water.

Sir Oliver Lodge lectured to the Royal Institution of Great Britain on the "Work of Hertz," and demonstrated the action of a coherer receiver.

1895.

Senatore G. Marconi's investigations led him to the conclusion that electrical actions and manifestations could be transmitted through the earth, air, or water by means of electrical oscillations of high frequency; and in consequence he made important experiments at his father's home in Italy.

Willoughby Smith established communication by conduction with the lighthouse on the Fastnet.

In April, Prof. Popoff described an arrangement of coherer and tapper for recording lightning flashes, and suggested its use for signalling to great distances. In July, he installed such an apparatus in the Meteorological Observatory at St. Petersburg, and succeeded in operating it from a Hertz oscillator 5 kilometres away.

1896.

On February 2nd Senatore Marconi came to England, and on June 2nd lodged his application for the first British Patent for Wireless Telegraphy, No. 12,039 of 1896.

In July of that year he was introduced to Sir William H. Preece, the Chief Electrical Engineer of the Post Office, at whose request Senatore Marconi conducted experiments over a distance of about 100 yards before the officials of the Post Office. Shortly afterwards a further series of trials was conducted by Senatore Marconi on Salisbury Plain, when communication was successfully established over a distance of 1¾ miles.

On July 27th the first demonstration of directional wireless, using reflectors, was given on the roof of the G.P.O., London.

On September 3rd experiments were conducted to determine the relative speed of propagation of light waves and the electric vibrations which actuated a receiver at a distance of 1¾ miles between reflectors.

On December 12th Sir William H. Preece lectured on Senatore Marconi's invention at Toynbee Hall, the inventor himself conducting the experiments.

1897.

In March, 1897, Senatore Marconi demonstrated before the representatives of various Government Departments, communication being established over a distance of 4 miles.

On March 17th balloons were first used for the suspension of wireless aerials.

In May further trials were made between Lavernock and Flatholm, a distance of over three miles; and on the 13th of that month the late Professor Slaby was present at further trials, when communication was established over a distance of about 8 miles.

In July, Senatore Marconi gave a demonstration of his invention at the Admiralty in Rome, and before King Humbert at the Royal Palace of the Quirinal. Between July 10th and 18th trials were made at Spezia, and on the 17th and 18th communication was maintained between the shore and the Italian cruiser *San Martin* at sea, at distances up to 10 miles.

On July 20th, 1897, the Wireless Telegraph and Signal Company, Limited, was incorporated, with a capital of £100,000, to acquire Senatore Marconi's patents in all countries except Italy and dependencies.

On August 27th Professor Slaby lectured on Wireless Telegraphy at the Sailors' Home, Potsdam, before the German Emperor and Empress and the King of Spain.

In September and October Senatore Marconi further experimented on Salisbury Plain. Trials were also made at Dover by officials of the Post Office. Apparatus was erected at Bath, and signals received from Salisbury, 34 miles away.

The first Marconi station was erected at the Needles, Isle of Wight, in November, and experiments conducted between that station and Bournemouth, a distance of 14½ miles.

On December 6th, in the presence of Captain Kennedy, R.E., tests were made between the Needles station and a steamer, readable signals being received up to a distance of 18 miles.

On December 7th the first floating wireless station was completed. It was operated by Senatore Marconi for developing the first two land stations on the Solent.

In this year, Sir O. Lodge patented various tuning arrangements for effecting "syntonic" wireless signalling.

1898.

In May, 1898, Senatore Marconi experimented between St. Thomas's Hospital and the House of Commons. In the same month experiments were carried out between Ballycastle and Rathlin Island, a distance of 7½ miles.

On June 3rd Lord Kelvin visited the Needles station and sent from there the first paid marconigram.

On July 20th and 22nd the events of the Kingstown Regatta were reported by wireless telegraphy for the Dublin *Daily Express*, from the steamer *Flying Huntress*, equipped with Marconi apparatus.

On August 3rd wireless telegraphic communication was established between the Royal yacht *Osborne* and Ladywood Cottage, Osborne, in order that Queen Victoria might communicate with the then Prince of Wales. Constant and uninterrupted communication was maintained during the sixteen days the system was in use.

On August 26th wireless messages were successfully transmitted through fog from Rathlin lighthouse.

In September the installation at Bournemouth was removed to Poole Harbour, Dorset.

By arrangement with Trinity House, wireless apparatus was installed in December, 1898, on the East Goodwin Lightship and at the South Foreland Lighthouse, the intervening distance being 12 miles.

1899.

During a gale in January, 1899, the East Goodwin Lightship was damaged and the mishap reported by wireless telegraphy to Trinity House.

On March 2nd Senatore Marconi read a paper on Wireless Telegraphy at the Institution of Electrical Engineers.

On March 3rd the s.s. *R. F. Matthews* ran into the East Goodwin Lightship. The accident was reported by wireless telegraphy to the South Foreland Lighthouse, and assistance was promptly sent.

On March 27th communication was established between Wimereux, near Boulogne, and the South Foreland Lighthouse.

On April 22nd the first French gunboat was fitted with wireless telegraph apparatus at Boulogne.

The first wireless station at Chelmsford was finished on June 1st, and this was closely followed by the first wireless station at Dovercourt, which was finished and communicated with Chelmsford station on July 13th.

On July 14th Prof. Tuma established wireless communication between two balloons at Vienna.

During the naval manœuvres in July three British warships, equipped with Marconi apparatus, interchanged messages at distances up to 74 nautical miles (about 85 land miles).

During the meetings of the British Association at Dover and of the Association Française pour l'Avancement de Science at Boulogne, in August, communication was maintained by means of apparatus installed at the Dover Town Hall and at Wimereux.

The international yacht races which took place in September and October were reported by wireless telegraphy for the *New York Herald*. At the conclusion of the races, a series of trials was made between the United States cruiser *New York* and the battleship *Massachusetts*, signals being exchanged between the vessels at distances up to about 36 miles. On the return journey from America Senatore Marconi fitted the s.s. *St. Paul* with his apparatus, and on November 15th established communication with the Needles Station when 36 miles away. Reports of the progress of the war in South Africa were telegraphed to the vessel, and published in a leaflet entitled *The Trans-atlantic Times*, printed on board.

In October the War Office adopted Marconi apparatus for use in the field in South Africa, and on November 2nd six engineers left for South Africa with sets of apparatus. These proved of considerable service to the Army and the Navy, to which latter they were subsequently transferred.

On November 22nd the Marconi Wireless Telegraph Company of America was formed for the purpose of exploiting Marconi patents in the United States of America and possessions.

1900.

On February 2nd Senatore Marconi delivered a discourse on "Wireless Telegraphy" at the Royal Institution.

On February 18th the first German commercial wireless station (Norddeutsche Lloyd Steamship Company) was opened on Borkum Island.

On February 28th the first German liner (*Kaiser Wilhelm der Grosse*) fitted with wireless apparatus communicated with Borkum Island over a range of 60 miles.

On April 25th the Marconi International Marine Communication Company was incorporated, with offices in London and Brussels, and agencies in Paris and Rome, for the maritime working of the Marconi system.

On April 26th Senatore Marconi took out his important patent, No. 7,777, upon which all modern development is based, and which is commonly referred to as the "four sevens patent."

On July 4th a contract was made between the Marconi Co. and the British Admiralty for the installation of apparatus in twenty-six of His Majesty's ships and at six Admiralty coast stations.

In October the erection of the High Power Station at Poldhu was commenced, the engine-house being built in this year.

The first wireless land station in Belgium was finished at La Panne on November 2nd.

The *Princesse Clémentine* was fitted with wireless telegraphy on November 3rd, and communication established with La Panne and maintained the whole way from Ostend to Dover

Mr. W. Duddell discovered the phenomena of the "singing arc," by which continuous oscillations can be set up.

1901.

On January 1st the barque *Medora* was reported by wireless as water-logged on Ratel Bank. Assistance was immediately sent.

On January 19th the *Princesse Clémentine* ran ashore, and news of the accident was telegraphed to Ostend by wireless.

On January 22nd the wireless station at the Lizard was finished.

On February 11th communication was established between Niton Station, Isle of Wight, and the Lizard Station, a distance of 196 miles

On February 14th the construction of transmitting and receiving plant and the aerial for the Poldhu Transatlantic station was commenced.

On March 1st a public Wireless Telegraph Service was inaugurated between the five principal islands of the Hawaiian group—viz., Oahu, Kauai, Molaki, Maui and Hawaii.

In April communication was successfully established and maintained between a station at Calvi, Corsica, and another at Antibes, in the Riviera.

On May 15th, 1901, Senatore Marconi read a paper on Syntonic Wireless Telegraphy at the Royal Society of Arts, London.

The first British ship, the s.s. *Lake Champlain*, was equipped with wireless telegraphic apparatus on May 21st. About the same date coast stations in England and Ireland were opened for communication with ships at sea, as follows:—Crookhaven, Co. Cork; Rosslare, Co. Wexford; Holyhead; Caister, near Yarmouth; North Foreland.

The masts at Poldhu were wrecked during a very heavy gale on September 20th, and the masts at Cape Cod shared a like fate two months later. The masts were then replaced by four towers, 210 ft. high, built of timber.

On September 26th a contract was entered into by the Marconi Co. for the installation of wireless apparatus at ten of Lloyd's Signal Stations.

On October 15th the first fan aerials were erected for experiments between Poldhu and Newfoundland.

The Compagnie de Télégraphie sans Fil of Brussels was formed on October 26th, to develop and work the Marconi system on the Continent.

On December 12th and 13th signals were received by Senatore Marconi at St. John's, Newfoundland, from Poldhu station, Cornwall, a distance of 1,800 miles.

1902.

In February Senatore Marconi received onboard the s.s. *Philadelphia* readable messages up to a distance of 1,551 statute miles, and signals up to a distance of 2,099 statute miles from Poldhu Station, Cornwall.

Senatore Marconi gave the first wireless demonstration in Scotland on May 6th at Dundee, and lectured on the "Progress of Electric Space Telegraphy" at the Royal Institution of Great Britain on June 13th.

On June 25th the first moving wire magnetic detector actuated by clockwork was installed on the Italian cruiser *Carlo Alberto*.

On July 14th-16th Senatore Marconi received messages from Poldhu on the Italian battleship *Carlo Alberto*, lying at Cape Skagen, a distance of 800 miles; and at Kronstadt, 1,600 miles.

The Colonial Premiers who were in England for King Edward's coronation witnessed a demonstration on board the *Koh-i-noor*.

On October 19th the cruiser *Carlo Alberto* left Plymouth for long distance experiments.

The Marconi Wireless Telegraph Company of Canada was formed on November 1st.

On December 17th the first wireless message was transmitted across the Atlantic. On December 18th wireless messages were despatched by Senatore Marconi and the Earl Minto from the Cape Breton Station to His Majesty King Edward VII. Senatore Marconi also sent a message to King Victor of Italy.

1903.

President Roosevelt sent a Transatlantic message to King Edward VII *via* Cape Cod and Poldhu Stations on January 18th.

The first Transatlantic marconigram was published in *The Times* on March 30th.

On April 5th the first license for the erection of an Italian high-power station was granted.

The Compagnie Française Maritime et Coloniale de Télégraphie Sans Fil was formed on April 24th to exploit the Marconi system in France.

An agreement was made on July 24th by the British Admiralty for the general use of the Marconi system in the Navy.

The first International Conference on Wireless Telegraphy was held in Berlin on August 4th.

On August 22nd a wireless telegraphic service of news to ships at sea was inaugurated.

The passengers of the Red Star liner *Kroonland*, which was disabled on December 8th, 130 miles west of the Fastnet, were saved great inconvenience by wireless communication being established with the Crookhaven Station.

V. Poulsen took out his patent for the improved arc oscillation generator using a hydrocarbon atmosphere and a magnetic field.

1904.

On January 20th the first Press message was transmitted across the Atlantic.

Meteorological information was supplied by wireless to the *Daily Telegraph*.

Accidents to s.s. *New York* and s.s. *Friesland* were reported by wireless telegraphy.

On August 15th the Wireless Telegraph Act of Great Britain was passed.

On August 22nd the Wireless News Message Service to liners was inaugurated.

On November 16th Dr. J. A. Fleming took out his original patent, No. 24,850, for thermionic valves.

In this year W. Duddell published a description of his thermo-galvanometer for the measurement of small high-frequency currents.

1905.

On January 1st ships' messages were accepted at British Post Offices.

Judgment was given by Judge Townsend in New York on May 4th in

favour of the Marconi Company in its action against the De Forest Wireless Telegraph Company for infringement of patents.

On May 12th the Canadian Government ordered stations for Cape Sable (N.S.) and St. John (N.B.).

On May 30th instructions were given by Trinity House for five more lightships to be installed with wireless apparatus.

On September 4th the first demonstration was given of long distance wireless reception with an open oscillating circuit stretched along the ground.

Erection of the Clifden High-Power Station (Ireland) was commenced in October.

The results of the classical experiments made by W. Duddell and J. E. Taylor investigating the law governing the transmission of electriomagnetic waves over short distances were published in this year.

In 1905 Senatore Marconi took out his patent for the horizontal directional aerial (No. 14,788), which marked a step of great importance in the progress of long-distance work.

1906.

General H. H. C. Dunwoody discovered the rectifying properties of carborundum crystals, and G. W. Pickard discovered the similar properties of silicon crystals. These discoveries formed the basis of the widely used crystal detectors.

On March 23rd the first high-power directional aerial was used at Clifden.

On August 4th the Compañià Marconi de Telegrafia Sin Hilos del Rio de la Plata (Argentine) was formed to work Marconi patents in Argentina and Uruguay.

In October and November an International Radiotelegraphic Conference was held at Berlin, and a convention signed by most of the countries of the world.

On October 25th, Dr. Lee de Forest filed a U.S. Patent application for a "Device for Amplifying Feeble Electrical Currents," in which a third electrode (in the form of an extra plate) was introduced into the original two-electrode thermionic valve.

On December 20th the first experiments with the Marconi high-speed disc discharger were carried out.

1907.

On January 29th, Dr. Lee de Forest filed a U.S. Patent application for an improved "Audion," in which the third electrode was in the form of a grid.

Early in this year E. Bellini and A. Tosi began their experiments—each on quiet different lines, but with a common aim designed to attain directivity in wireless signalling'

Marconi Transatlantic Stations at Clifden, Ireland, and Glace Bay (Nova Scotia) were opened for limited public service on October 17th.

G. W. Pickard and G. W. Pierce both filed several U.S. Patent applications for various forms of crystal detector.

1908.

On February 3rd transatlantic stations were opened to the general public for transmission of messages between the United Kingdom and the principal towns in Canada.

Senatore Marconi lectured on "The Commercial Application of Wireless Telegraphy" at Liverpool on February 24th.

The Russian Company of Wireless Telegraphs and Telephones was formed on October 8th.

1909.

The s.s. *Republic*, after collision with the s.s. *Florida* off the coast of the United States on January 23rd, succeeded in calling assistance by wireless, with the result that all her passengers and crew were saved before the vessel sank.

Senatore Marconi lectured before the Dutch Royal Institute of Engineers in May and in December.

The Marconi British coast stations were taken over by the Postmaster-General on September 29th, who was granted a license to use the company's patents.

In December Senatore Marconi lectured at the Royal Academy of Science, Stockholm, and (with Prof. Braun) was awarded the Nobel Prize for Physics.

1910.

On February 7th the first Wireless Shipping Report was published at Lloyd's.

Senatore Marconi, *en route* for Buenos Aires on board the *Principessa Mafalda*, received messages from Clifden at a distance of 4,000 miles by day and 6,735 miles by night.

On April 23rd the Marconi Transatlantic (Europe-America) Service was opened.

The Compania Nacioñal de Telegrafia sin Hilos was formed on December 24th to exploit the Marconi system in Spain.

1911.

On February 21st judgment was given in the action instituted in December, 1910, by the Marconi Company against the British Radio Telegraph and Telephone Company for infringement of their tuning patent No. 7777 of 1900. Mr. Justice Parker's decision was in favour of the Marconi Company, and he granted them a certificate of validity of their patent and an injunction, together with costs and damages.

A contract was made between the Marconi Company and the Canadian Government for operating wireless telegraph stations in Canada for a period of 20 years.

Stations at Teneriffe, Cadiz, Barcelona, and Las Palmas were opened for public business by the Compania Nacioñal de Telegrafia sin Hilos, the *concessionnaires* of the public wireless telegraph service of Spain.

The Imperial Conference held in May approved the proposal that an Imperial Wireless Telegraph system should be created.

Senatore Marconi lectured on "Radiotelegraphy" at the Royal Institution on June 2nd.

The Lodge-Muirhead patents were acquired by the Marconi Company, and Sir Oliver Lodge became a scientific adviser to the Company.

1912.

Early in the year the American Marconi Company absorbed the United Wireless Company of the United States.

On January 27th the central station of the Spanish wireless service (Aranjuez) was opened by King Alfonso XIII.

In February the Marconi Company secured the patents of Bellini and Tosi, including those for the wireless direction-finder.

On February 9th the first Australian Commonwealth Station was opened.

On April 15th the s.s. *Titanic* struck an iceberg and sank, but, owing to the prompt wireless call for assistance, the lives of more than 700 of her passengers were saved.

Senatore Marconi, whilst in America, delivered an address on the "Progress of Wireless Telegraphy" before the New York Electrical Society, on April 17th.

The International Radiotelegraphic Conference, opened in London on June 4th, approved important regulations to secure uniformity of practice in wireless telegraphic services.

On July 5th the International Radiotelegraphic Convention was signed at London.

The British Government entered into a contract in July with the Marconi Company for the erection of a chain of high-power Wireless Telegraph stations, as recommended at the Imperial Conference held in 1911.

The Marconi Wireless Telegraph Company of Canada was entrusted by the Dominion Government on September 17th with the working of the existing stations on the Great Lakes until 1931, and also with the erection of further stations. A similar arrangement was made in December with the Newfoundland Government for stations at Belle Isle, and on the Labrador coast.

1913.

During this year the Governments of France and the United States experimented between the Eiffel Tower station and Washington by wireless, to secure data for comparing the velocity of electro-magnetic waves with that of light.

In January the High Court of Justice of France delivered a judgment declaring the validity of all claims of the Marconi patent 305060, which corresponds with the British "four sevens" patent.

On January 23rd the Postmaster-General appointed a committee "To consider and report on the merits of the existing systems of long-distance wireless telegraphy, and in particular as to their capacity for continuous communication for the distances required by the Imperial Chain."

As a result of the official enquiry into the loss of the *Titanic*, the *Scotia*, equipped with a Marconi wireless installation, left Dundee on March 8th to patrol the waters of the North Atlantic and to collect information regarding the movement of ice.

In June a Wireless Telegraph Bill was presented to the Ottawa Parliament, and passed under the title: "Radiotelegraph Act of Canada."

On October 11th the *Volturno* was burnt in mid-Atlantic, and in response to the wireless appeal ten vessels came to the rescue, 521 lives being saved.

The Wireless Society of London was formed in October.

On November 12th an International Conference for the purpose of considering means of saving life at sea was opened in London by the President of the Board of Trade.

On November 24th the first practical trials with wireless apparatus on trains were made on a train belonging to the Delaware, Lackawanna and Western Railroad of America.

On November 25th Commander H. A. Edwards, who was at the head of the Bolivian Survey Commission, reported that the Commission had been able to determine the difference of longitude between the Brazilian towns Mañaos and Porto Velho by means of wireless signals.

Dr. Mawson, whilst exploring in Antarctica, was enabled by means of wireless to keep in touch with the outer world through the station on Macquarie Island.

During his expedition to Central Asia Dr. Filippo de Filippi, the Italian explorer, frequently determined his longitude by means of wireless time signals transmitted from Lahore.

1914.

On January 20th the Safety of Life at Sea Convention, drawn up by the International Conference which met on November 14th, 1913, was signed at London. That section of the Convention which deals with Wireless Telegraphy lays down the minimum wireless telegraphy equipment to be carried by vessels of different grades.

Early in the year an International Wireless Conference met at Brussels. The object of the Conference was to adopt a programme whereby careful observations could be taken with a view to arriving at some practical explanation of the laws governing the variation in the strength of wireless signals.

During the early part of March Senatore Marconi joined one of the Italian war vessels attached to the squadron commanded by the Duke of Abruzzi. Experiments in wireless telephony were carried out between several vessels lying at anchor ⅝ mile apart, ordinary receivers being used with great success. The wireless telephone experiments were continued between two warships on the high seas, and the reception was consistently good over a distance of 18½ miles. Successful wireless telephone communications were effected later, using only very limited energy between vessels on the high seas 70 km. (44 miles) apart. These experiments were repeated where land intervened between the communicating vessels, and in this case again excellent results were obtained. On this day radiotelephonic communication was constantly maintained for twelve hours.

This year saw the first practical application of wireless to lifeboats belonging to large ocean steamships, the Marconi Company having designed a special type of apparatus for this purpose.

On April 12th the Council of the Royal Society of Arts presented the Society's Albert Medal to Senatore Marconi for his services in the development and practical application of wireless telegraphy.

On April 15th, at Godalming, a memorial was unveiled to the memory of Jack Phillips, chief wireless telegraphist of the ill-fated *Titanic*, who "died at his post when the vessel foundered in mid-Atlantic on the 15th day of April, 1912."

On June 8th a report was issued by the committee appointed by the Postmaster-General to consider how far and by what methods the State should make provision for research work in Wireless Telegraphy. This report recommends (1) that the Government should establish a National Committee for Telegraphic Research which would promote in the public interest, both by theoretical investigation and by experiment, the progress of telegraphy and telephony, and (2) that the Government should establish a National Research Laboratory, with a special scientific staff to undertake, under the direction of the committee, and on the lines laid down in this report, telegraphic investigation, the results of which should be available for all departments of the public service.

In June important tests were made with the Marconi-Bellini-Tosi wireless direction finder on board the s.s. *Royal George*. During a voyage from Bristol to Montreal the liner, even in the thickest weather and without the aid of compass or sextant, was enabled to find her position when within a radius of about fifty miles of a land wireless station.

On July 24th judgment for plaintiffs was delivered in an action brought by the Marconi Company against the Helsby Wireless Telegraph Company, Limited, for infringement of patent 7777 of 1900.

War was declared on Germany by Great Britain on August 4th, and all *private* radiotelegraphy was suspended.

On August 9th the wireless station at Dar-es-Salaam, German East Africa, was announced to have been destroyed by the British.

The German station at Yap, Caroline Islands, was destroyed on August 12th.

On August 24th the Germans blew up the giant station at Kamina, Togoland, to prevent its falling into the hands of the British.

On August 24th the United States Government notified the owners of the German Transatlantic station at Tuckerton, New Jersey, that its experimental license had expired, and it must therefore close down. Arrangements were afterwards made for restricted working.

On August 29th the German wireless station at Samoa was captured by an Australian Naval Force. The German station at Nauru, Marshall Islands, was captured shortly after this.

On September 12th an Australian Naval Reserve Force captured the German wireless station at Herbertshohe on the island of Neu Pommern.

The powerful German station at Duala, Cameroons, was seized on September 27th.

On November 9th a Japanese force occupied Kiauchau and its wireless station.

On November 13th the Marconi Wireless Telegraph Company of America obtained a preliminary injunction against the De Forest Radio Telephone and Telegraph Company and the Standard Oil Company in a suit for infringement of patent.

On November 28th the following notice, under the Defence of the Realm (Consolidation) Regulations 1914, was issued : "No person shall, without the written permission of the Postmaster-General, buy, sell, or have in his possession or under his control any apparatus for the sending or receiving of messages by wireless telegraphy, or any apparatus intended to be used as a component part of such apparatus."

During the year high-power transoceanic stations were completed at Carnarvon (Wales), Belmar, New Jersey (U.S.A.), Honolulu (Hawaiian Islands), and San Francisco (Cal.). The Honolulu and San Francisco stations were formally opened to public service on September 24th.

1915.

On February 20th the Panama-Pacific Exhibition at San Francisco was officially opened by President Wilson at Washington, through the medium of wireless telegraphy.

A wireless telegraph service between Spain and Italy was inaugurated on May 1st.

On May 12th the German high-power wireless station at Windhoek was captured by a South African force.

On May 12th, in Battery Park, New York, the Mayor of New York unveiled the monument in memory of wireless operators who had lost their lives at the post of duty.

On July 8th, as a result of investigations into alleged breaches of neutrality, the United States Government decided to take over the control of the Telefunken wireless station at Sayville, Long Island.

On July 27th wireless communication between the United States and Japan was effected. The two terminal stations were situated at San Francisco and Funabashi, near Tokio, and the messages were relayed through Honolulu.

In July and September communication was obtained between Arlington and Hawaii by wireless telephony, a distance of over 4,800 miles. The transmitting apparatus was installed at Arlington Naval Radio Station by the Western Electric Co.

On October 26th the wireless telephone experiments were continued, communication being effected across the Atlantic from Arlington to the Eiffel Tower, Paris.

At the end of August the submarine cable between Oban and south-east Mull broke, and until its repair wireless telegraphy formed the only means of communication between the outlying islands and the mainland.

In September a commercial wireless service was inaugurated between Japan and foreign countries *via* Ochüshi and Petropavlovsk, in Siberia.

In November Mr. Daniels, United States Secretary of the Navy, successfully transmitted from Washington a wireless telephonic naval order to Rear-Admiral Usher at Brooklyn Naval Yard.

On December 1st the wireless station at Macquarie Island was closed for the period of the war.

1916.

In January, by an Order in Council, His Britannic Majesty prohibited to all destinations the export of material for wireless telegraphs and telephones.

In February the Pope, restoring an ancient custom of the Church, announced his intention of officially blessing wireless telegraphy in recognition of its services to mankind.

During the course of a severe blizzard in the United States in February wireless telegraphy was extensively used for train despatching, as the telegraph wires had been destroyed.

In the early part of the year wireless enthusiasts in Holland formed a wireless association, "The Nederlandsche Vereeniging voor Radio-Telegraphie," with headquarters at The Hague.

During the Irish rebellion at Easter in this year wireless telegraphy played an important part, as the insurgents had entirely isolated Ireland by cutting the cable to England.

Among the subjects discussed at the Pan-American Conference held at Buenos Aires in April was the control of wireless telegraphy. This constituted a big step forward on the part of the South American Republics, clearly proving their appreciation of the necessity of a reliable wireless telegraphic service.

The determination of the difference in longitude between Paris and Washington with the aid of wireless telegraphy, which had been in progress since October, 1913, was completed in May, the result, expressed in terms

of time, being 5 hours 17 minutes 35·67 seconds, and has a probable accuracy of the order of ·01 second.

On July 28th the *London Gazette* printed the text of a new official regulation requiring the owner of every vessel of 3,000 tons or over registered at a British port in the United Kingdom to take out a license for a wireless installation before August 21st, 1916, irrespective of whether his ship carries passengers or not.

On September 20th, Judge Mayer, of the U.S.A. District Court, delivered an important decision regarding the suit tried before him, affecting the patents involved in the Fleming Valve controversy between the Marconi's Wireless Telegraph Company of America and the De Forest Radio Telegraph and Telephone Company. He gave his decision in favour of the former, and his judgment has been pronounced to constitute one of the finest opinions on technical matters delivered from the American Bench.

On November 12th, Senatore Marconi delivered an important lecture at the Lincei Academy, Rome, before H.R.H. the Duke of Genoa and a most distinguished audience. He took as his subject those problems of Radiotelegraphy to which scientists are likely to direct their attention in the immediate future.

The initiation of the newly established Trans-Pacific Wireless Service between the U.S. and Japan was celebrated on Wednesday, November 5th, by an interchange of messages between the Mikado and President Wilson.

1917.

On February 28th the wireless station of the *New York Herald*, re-equipped by the Marconi Wireless Telegraph Co. of America, again started operations.

On March 12th a new station was opened at Cape May (New Jersey), about a mile from the old installation and half a mile from the point of Cape May.

On March 12th a Women's Division of the National Amateur Wireless Association was formed in New York for war-time instruction, the first class of 25 convening at Hunter College, New York City.

At the beginning of August the British Government found it advisable in national interests to suspend the Transatlantic Commercial Wireless Service, both eastbound and westbound.

On May 8th the Circuit Court of Appeals, New York City, confirmed the decision of Judge Mayer (reprinted in the YEAR-BOOK for 1917) that the De Forest Audion was an infringement of the Fleming Valve Patent and handed down an unanimous opinion in favour of the Marconi Wireless Telegraph Co. of America.

June 2nd marked the "coming of age" of wireless telegraphy—*i.e.*, that 21 years had elapsed since the registration of patent 12039 in 1896.

On June 29th and 30th tests of Marconi's timed spark for continuous wave generation were carried out between the United Kingdom and the U.S.A.

In June, Commissioner Woods, of New York, pronounced the City's Police Wireless System a "demonstrated success" in a public statement officially issued by him.

In October, 1917, a radiophone fog warning device was installed by the United States Naval Communication Service near Newport, Rhode Island.

In the course of the year the Netherlands Government established two new radiotelegraphic stations on lightships at the Dogger Bank. Several

new stations were opened by Norway, including Rundermand Station, near Bergen, and Trywand Station, near Christiania.

Wireless communication was also opened up in the course of the year with Tulagi (Solomon Island) and with Ocean Island (Gilbert Group).

1918.

The trend of progress towards continuous wave communication as distinct from that by damped waves was very marked during this year, a particular impetus being given by the continued development of the thermionic valve as an efficient receiver and generator of undamped oscillations. Steady improvement was also evident in the arc form of generator which was installed in many new high-power stations.

Wireless telephony also progressed to a marked extent, particularly in the direction of reliability and increase of range, due mainly to the development of valve generator and receivers.

In the equipment of aircraft with wireless great progress was made, both in radiotelegraphy and radiotelephony.

With the signing of the Armistice the enormous part played in the war by the series of directional wireless stations utilising the Marconi modifications of the Bellini-Tosi Radiogoniometer was made public.

Several new high-power stations, forming part of the scheme of high-power wireless communication in the United States, were opened during the year. One of these, which is claimed to be capable of communicating over a distance of at least 4,000 miles, was erected at Annapolis, Md.

In the Argentine the erection of a station destined for direct communication with the N. American continent was commenced in the vicinity of Buenos Ayres. It is owned by the Pan-American Wireless Telegraph and Telephone Company.

Considerable progress was also made with the erection of a Government wireless station at Karlsborg, Sweden, by the Telefunken Company.

The extension in the application of wireless telegraphy to merchant vessels continued, and at the close of the year some 2,500 to 3,000 vessels of the British Mercantile Marine carried installations.

On August 1st an Order in Council was published to the effect that every British sea-going ship of 1,600 gross tonnage or upwards registered in New Zealand, in respect of which a license to instal wireless telegraph apparatus is or has been granted by the Minister of Telegraphs, shall be provided with a wireless telegraph installation, and with two certified operators.

On July 31st the U.S. Government took over all wireless land stations in the United States, with the exception of certain high-power stations, which remained under the control of commercial companies.

In August a powerful station was opened at Balboa, at the entrance to the Panama Canal. In connection with this station a wireless time signal service was inaugurated.

On September 22nd messages transmitted from Carnarvon were received in Sydney, 12,000 miles away. Cable confirmations of these messages were sent forward at the same time, but were received some hours later than the corresponding radiotelegrams.

In March wireless communication was established between San Diego, California, and the American Legation in Pekin, a distance of roughly 7,500 miles.

In April a high-power station was opened at Stavanger, Norway, for the use of the Norwegian Government. This station, for direct communication with the United States, was erected by the Marconi Company.

On December 3rd the Marconi Transatlantic Service between Clifden and Glace Bay was reopened for public communication. Commercial working across the Pacific from San Francisco to Hawaii and Japan was resumed on December 19th.

1919.

The year 1919 chiefly was characterised by the publication of some of the wartime researches carried out in various Government Departments.

The eclipse of the sun, on May 29th, was utilised by the British Association Radio Committee for further investigations on the propagation of wireless waves and of atmospheric disturbances. Knowledge of this subject has also been increased by valuable investigations by Dr. Watson, by Dr. van der Pol and by Dr. Chapman in connection with effects taking place in the upper atmosphere.

In September the British Association resumed their annual meetings, which had been suspended during the latter stages of the war. At this meeting a number of useful papers of wireless interest were presented, dealing particularly with war-time developments.

The several transatlantic aerial flights which took place during the year demonstrated the great utility of wireless communication with aircraft. In both the American flight on the NC 4 machine, and the British on the R 34 dirigible, great use was made of wireless communication. The R 34 was in communication with both sides of the Atlantic during most of the flight.

The temporary war measures relative to the installation of wireless telegraph apparatus on all merchant vessels of 1,600 tons or over were made permanent by a Bill introduced by Lord Somerleyton.

In February a Spanish decree was issued to the effect that all sailing vessels of 500 tons or over, and carrying fifty or more passengers, are to carry a wireless installation.

During the year the Chinese National Wireless Company was formed for the manufacture of wireless equipment in China.

The Companhia Radiotelegraphica Brazileira was also formed to exploit the patents of the Marconi Company in Brazil.

Two subsidiary Marconi Companies—the Marconi Scientific Instrument Company and the Marconi-Osram Valve Company—were formed to take over special work for the parent Company.

In America an important amalgamation was effected with the formation of the Radio Corporation of America, which took over the radio interests of the American Marconi Company and the General Electric Company of Schenectady.

The war-time ban on private and experimental wireless installations was partially removed in this country, and wholly so in America.

Improvements in valve transmitting apparatus for radiotelephony enabled a test to be carried out by the Marconi Company across the Atlantic with the object of ascertaining the minimum power necessary for effective telephonic communication over that range. Good results were obtained using only two transmitting valves.

1920.

The steady development of continuous wave wireless work was continued during the year and some further progress made in the commercial application of valve apparatus.

The annual British Association meeting held at Cardiff at the end of 1920 had little of radio interest, and only one paper dealing directly with the subject was presented.

The Lafayette radio station at Bordeaux, which was under construction by the United States Navy during the war, was completed, and underwent tests during August and September. The first official message from this station was sent out on August 21st, 1920, and was addressed to the Secretary of the United States Navy. It ran as follows: "This first wireless message to be heard around the world marks a milestone on the road of scientific achievement."

The high power station at Sayville, which was closed by the United States authorities during the war, was reopened for traffic in April of this year, and a new station at Christiania was opened on January 10th for European traffic only, the Stavanger station being reserved for traffic with the United States.

Plans were prepared and work commenced on an extremely large wireless station for erection on Long Island by the Radio Corporation of America. Six thousand acres of land were purchased and at least five separate aerial systems were planned for simultaneous communication with France, Italy, Poland, Scandinavia, Germany and the Argentine.

A number of smaller coastal and other stations whose services were suspended during the war were reopened for traffic.

A number of D.F. stations both in this and other countries, which were originally put up by Government Departments for wartime use, are also made available for merchant service purposes and have given valuable aid in navigation in difficult waters.

In order to relieve the congestion on the internal telegraph network, the German Government erected a number of medium power radio stations in the important industrial centres of the country. The majority of the pre-war Press, Time Signal, and Meteorological Services were re-established in most countries. A novelty in this direction was the establishment of an astronomical service from the Nauen Station to give information on important astronomical events to all neighbouring obervatories, so that observations on outbursts of novæ and similar phenomena could be taken in hand without delay. The British Air Ministry established a comprehensive scheme of meteorological bulletins, which are transmitted both from their own station and from the Aberdeen Wireless Station several times during the twenty-four hours. These messages give the latest information about flying conditions over the British Isles and neighbouring countries.

The most noticeable improvements in commercial apparatus have been those of wireless telephonic apparatus carried out by Marconi's Wireless Telegraph Company at Chelmsford. On a number of occasions during the year transmissions were carried out from that station using as much as 15 kW, and regular concert programmes have also been sent. These transmissions were picked up as far away as St. John's, Newfoundland, a range of 2,673 miles, while ships 1,000 miles at sea also overheard the programmes. The successful linking up of wireless telephonic apparatus with the land line telephones was accomplished, and on August 19th a successful connection was established between a subscriber's instrument in London and an aeroplane in flight on its way to Paris. Regular wireless telephonic transmissions have also been carried on from a Dutch Wireless Station.

Continuous wave valve apparatus was also applied extensively on shipboard, and a number of well-known liners were fitted with powerful installations which enable them to maintain direct communication with the land over distances of at least 1,400 miles.

The United States battleship *Iowa* was fitted with a radio control installation and experiments carried out by the United States Naval Department to test the possibility of navigating this 12,000 ton vessel from the shore.

The Imperial Wireless Telegraphy Committee, which was appointed on November 24th, 1919, by the Secretary of State for the Colonies "to prepare a complete scheme of Imperial wireless communications in the light of modern wireless science and Imperial needs," published its report in June. In this report they recommended the adoption of a scheme using thermionic valve apparatus at transmitting stations, with stages not exceeding 2,000 miles in length.

The Government of India formed an Indian Wireless Telegraph Board, with a view to extending and reorganising its existing telegraph system, in order to meet the strategic, political and commercial requirements of the Empire.

An Air Conference, organised by the Air Ministry, was held in London from October 12th to 14th. A number of papers were read and discussed at this meeting, which emphasised the importance of wireless equipment on aircraft, not only for direction finding, but also for communicating with the landing grounds and with the land telephone system by wireless telephony, and for the rapid circulation of weather forecasts.

The Department of Scientific and Industrial Research established four sub-committees to assist the Radio Research Board. These were to deal respectively with the following branches of radio research: (*a*) the propagation of wireless waves; (*b*) atmospherics; (*c*) directional wireless; (*d*) thermionic valves.

It was announced on July 21st that the German Wireless Stations were all in full and unrestricted operation again.

During the year the French Government carried out an important series of investigations with regard to the transmission of wireless signals over long distances. A special vessel, the *s.s. Aldebaran* was equipped for this purpose and carried out in particular measurements of signal strengths received in the Southern hemisphere from French stations. The phenomena occurring at and near the Antipodes of a high power station were also investigated.

As from January 10th of this year the Republic of Czecho-Slovakia adhered to the Telegraphic and Radiotelegraphic Conventions.

On January 14th a law was passed in Greece making the carrying of wireless apparatus obligatory on all Greek merchant ships of 1,600 tons gross and upwards, or having 50 or more persons aboard including crew. Certain modifications were also made in the rules and regulations governing wireless telegraphy in the British Mercantile Marine. As from September 1st, 1920, automatic call apparatus may be installed subject to the approval of the Board of Trade. For voyages other than coastwise ones exceeding 48 hours from port to port, any vessel carrying 200 passengers or more must carry three operators. For voyages exceeding eight hours, but less than 48 hours from port to port, two operators must be carried. Regulations were also issued relative to the carrying of wireless telegraph watchers on board in place of one or more certificated wireless operators.

The Gold Medal of the Institute of Radio Engineers for the year 1920 was awarded by the Board of Direction of the Institute to Senatore Marconi.

The Paris Academy of Sciences Hebert Prize for 1919 was awarded early in 1920 to Raymond Jouaust for his work on Magnetism, Electrical Standards, Photometry and Wireless Telegraphy.

The American Academy of Arts and Sciences awarded the Rumford premium to Dr. Irving Langmuir for his research in thermionic and allied phenomena.

Prof. E. Branley was promoted to the grade of Officer of the Legion of Honour.

The following new companies interested in or connected with radiotelegraphy were formed during the year:—The Societatea Marconi at Bucarest, Roumania; Société Radio-technique en Pologne at Warsaw (to undertake the manufacture, installation and maintenance in Poland of every system of telegraphy including wireless); The Société Indépendante Belge de Télégraphie sans fil at Brussels; The Continental Radio Telephone and Telegraph Company at Dallas, Texas; The Radio Engineering Company, Ltd.; and the Argentine Radiotelegraphic Company, Ltd.

A new Radio Society was formed in Holland, known as the Nederlandsch Radio Genootschap, with the object of being the centre of scientific radio work in Holland. Two new French wireless publications appeared during the year, *Radioélectricité* and *La T. S. F. Moderne*.

Professor A. Righi, who was one of the earliest workers in the radiotelegraphic field and of whom Senatore Marconi was a pupil, died this year at Bologna. The death was also announced of Major S. C. A. Wace, head of the British Wireless Telegraphy Board.

Dr. Alexander Muirhead, who was associated with Sir Oliver Lodge's early work on wireless telegraphy, died on December 13th.

Amateur wireless work in this and other countries progressed steadily during the year with the gradual removal of wartime restrictions.

1921.

One outstanding feature of 1921 as regards wireless matters has been not so much the discovery of new methods or apparatus as the refinement in the design of existing forms of wireless apparatus and the improvement of methods of measurement. Accurate measurement being the basis of all useful scientific work, improvements in this direction have helped and are still helping forward the practical application and utilisation of the discoveries and developments effected during the wartime period. The papers of wireless interest read before the British Association, and the Wireless Section of the Institution of Electrical Engineers also emphasise this aspect of the position.

The number and scope of high power wireless stations has been further increased. In January the foundation stone was laid of a new ultra-powerful wireless station at Sainte Assize, near Paris. Work on this station—known as the Paris Radio Central—has progressed rapidly, and the first portion of the work is now nearly completed. This central station is to be divided into three sections, devoted respectively to Long-range Oversea communications, Continental routes in Europe, and special duplex services to London and Madrid. The latter services were inaugurated during the year, and are now in regular operation, the average working speed between London and Paris being about 80 words per minute in each direction.

Work has also progressed rapidly on the New York Radio Central Station on Long Island, and on November 5th, President Harding formally opened the first part of this station.

In Java the Dutch Colonial Authorities have commenced the construction of a monster arc station to absorb up to 3,500 kilowatts, with which it is hoped to establish uninterrupted communication with Holland.

The substitution of valve transmitters in lieu of the older apparatus has enabled great improvements to be effected in the Transatlantic radio services of the Marconi Company.

Experiments have been carried out in France with successful results in the application of Baudot and similar high-speed telegraph apparatus to radio work.

On November 20th test messages transmitted from Carnarvon with a new valve transmitting plant were read in Australia, a distance of approximately 12,000 miles. Special press messages were also transmitted.

On December 18th, a demonstration of duplex wireless telephony between London and Amsterdam, Holland, was given by Marconi's Wireless Telegraph Company, Limited. For the purpose of the demonstration Marconi House, London, was linked by means of the ordinary trunk line with the wireless station at Southwold, and a similar arrangement was made in Holland between the wireless station at Zandvoort and the Amsterdam Stock Exchange. An unusually short wavelength was employed, giving immunity from interference from other stations.

The first station of the British Imperial Wireless Chain at Leafield, near Oxford, was formally opened on August 18th by the Postmaster-General. A 250 kW arc set is fitted at this station, which is ultimately to be employed for communication with a station at Cairo which is still in course of erection.

An International Wireless Conference was held in Paris in June, at which representatives from the leading nations discussed the regulation of the use of wireless and the allocation of certain wavelengths for various ranges and purposes.

An Imperial Conference was held in London during July and August to discuss improved communications within the British Empire. With regard to wireless communications it was agreed that steps be taken by H.M. Government for the erection of the remaining stations of the Imperial chain for which they are responsible, that the Governments of the Union of South Africa, of Australia and of India, should take similar action and that the Governments of Canada and New Zealand should co-operate. The Radio Research Board were also asked to investigate and report on the development and present position of Wireless Telephony.

An important conference was held in Paris towards the close of the year attended by representatives of the principal radio companies of the world. Important agreements were reached relative to long distance communications, commercial and Press services.

On March 3rd an important judgment concerning radio work in this country was delivered by Mr. Justice Sargent in connection with an application for the prolongation of the Poulsen Arc patent, the application being dismissed with costs.

On May 17th the U.S. District Judge Meyer delivered judgment in favour of E. H. Armstrong and the Westinghouse Electric and Manufacturing Company against the de Forest Radio Telephone and Telegraph Company, upholding the validity of E. H. Armstrong's "feed-back" or regenerative circuit for receiving, and his priority of invention of that circuit.

A close working agreement has been established between Swedish and British wireless interests, and an amalgamation has been effected between the Swedish Radio Company and Marconi's Wireless Telegraph Company.

La Compagnie Radio-France was constituted in June for the construction erection and working of radio stations in France for European and Transocean communication.

Two new Italian wireless Companies have been formed during the year, viz :—Societa' Anonima Fiumana per le Radio Communicazioni, and Societa' Italiana dei Servizi Radiotelegrafici e Radiotelefonici.

The Mullard Radio Valve Company, Limited, and C. F. Elwell, Limited, have also been incorporated during the year, the former for the manufacture of thermionic valves and valve apparatus, and the latter for arc apparatus and installations.

The Radio Corporation of America has effected agreements or amalgamations with the following firms to enable a pooling of all radio patents owned by them to be made :—The Westinghouse Electric and Manufacturing Company, The American General Electric Company, The International Radio Telegraph Company, the American Marconi Company, the American Telephone and Telegraph Company, and the United Fruit Company.

A merger has also been effected between the Marconi Wireless Telegraph Company of Canada and the Canadian General Electric Company.

By agreement with the Peruvian Government, Marconi's Wireless Telegraph Company, Ltd., have taken over and will operate for a period of twenty-five years the whole of the postal, telegraph and wireless services of Peru. Sir William Slingo, late Engineer-in-Chief of the British Post Office, has accepted the position of Chief of the Department. The Compagnie Générale de T.S.F. has also concluded a contract for a period of thirty years with the Government of Ecuador for the working of similar services in that State.

The Liebmann Memorial Prize was awarded by the Institute of Radio Engineers to Roy A. Weagant for his work in connection with the elimination of atmospherics.

The Edison Medal of the American Institute of Electrical Engineers for 1020 was awarded this year to M. I. Pupin for his physical and mathematical work.

The Albert Medal of the Royal Society of Arts was awarded to Professor J. A. Fleming in recognition of his inventions in connection with wireless and electrical science.

The following French Radio Engineers were during the year nominated Chevaliers of the Legion of Honour in recognition of their inventions and work :—J. Bethenod, E. Bloch, L. Bloch, A. Dufour, and M. Latour.

The Nobel Prize for Physics was this year awarded to Prof. Edouard Branly for his researches in connection with radio work.

The Triennial Osiris Prize of 100,000 francs has been awarded by the Institute of France to General Ferrié.

The Hebert Prize of the Paris Academy of Sciences was awarded to M. Léon Bouthillon for his work and publications on wireless telegraphy.

Thomas Thomassen Heftye, Director General of the Norwegian Telegraph Administration, died on September 18th as the result of a railway accident.

Dr. Edward B. Rosa, Chief Physicist of the Bureau of Standards, U.S.A., well known for his valuable contributions to electrical and wireless theory, and for his inductance formulæ, died on May 17th.

The progress made in amateur and experimental wireless is exemplified by the attempts made in February and December of this year to effect communication on short wavelengths between the wireless amateurs of America and Great Britain. The first attempt was unsuccessful, but during the

second test, signals from many American amateur stations were heard both by British radio amateurs and by the representative of the American Radio Relay League who was sent over during the tests. The signals were also heard in Holland.

The American Radio Relay League held its first Annual Convention in Chicago between August 30th and September 3rd, at which many thousands of U.S. radio amateurs were present.

The restrictions on amateur and experimental wireless work in France are gradually being removed, and the granting of transmitting licenses in that country is now under consideration.

A new monthly periodical containing important radio articles was commenced this year, entitled *Physica*. It contains the proceedings of the Dutch Physical Society. Another new radio periodical is *L'Audion*, which as the organ of the Radio Club of Italy is published twice monthly. The first issue appeared in December.

NATIONAL AND INTERNATIONAL WIRELESS LAWS & REGULATIONS

(A) Résumé of Radiotelegraphic Legislation.

(B) Text of International Radiotelegraphic Convention.

(C) Text of International Convention on Safety of Life at Sea.

(D) Wireless Laws and Regulations of the Countries of the World.

RÉSUMÉ OF RADIOTELEGRAPHIC LEGISLATION

LEGISLATION relating to Wireless Telegraphy does not date back further than the year 1903, although four years earlier (in 1899) the Marconi system had reached a point of development sufficiently advanced for the British Admiralty to think it desirable to obtain sets of apparatus for trial, and two years later (in 1901) an agreement of a limited nature was entered into between the Admiralty and the Company for the supply of Marconi apparatus. In July, 1903, a further and more complete agreement was concluded. At that time the increasing use of Wireless Telegraphy for maritime purposes throughout the world had raised questions of international interest, and circumstances had clearly demonstrated that international agreement was desirable with regard to many points dealing with the interchange of messages through the newly established medium.

A conference met at Berlin in August, 1903, on the invitation of the German Government. As a result of that conference all the Powers, with the exception of Great Britain and Italy, agreed to certain proposals, to be considered at a subsequent conference, for the international regulation of Wireless Telegraphy.

The Wireless Telegraphy Act, which was passed in 1904 for two years only, and which was renewed in 1906 without modification (and is still in force), prohibits the installation or working of wireless telegraph apparatus in the United Kingdom, or on board British ships, except under license from the Postmaster-General. Its principal objects were, by means of systematic regulations, to make Wireless Telegraphy more useful for purposes of defence and general communication. The memorandum which was laid before the House of Commons in explanation of the Bill stated that the necessity for legislation depended, firstly, on the importance from the naval point of view of giving the Government control over wireless stations in time of war or emergency; and, secondly, on the desirability of placing the Government in such a position as to have the power of entering into an agreement on the subject with other countries if it should be found expedient to do so.

In October, 1906, a second International Conference was held in Berlin, and its primary objects may be classified under the following headings:—(1) The acceptance and transmission of telegrams. (2) The adoption of rules of working. (3) The provision of means of collecting charges and settling accounts between the different countries. (4) Arrangements for the publication of all information necessary for inter-communication. (5) Rules to prevent interference and confusion in working, with adequate provisions for enforcement. (6) Provision that, with certain exceptions, inter-communication must not be refused on account of the differences in the systems of Wireless Telegraphy employed.

The documents signed at Berlin on November 3rd, 1906, consisted of:—(*a*) The Convention; (*b*) the Additional Undertaking; (*c*) the Final Protocol; (*d*) the Service Regulations. These documents were revised at the London Convention held in 1912, and the Radiotelegraphic Convention which came into operation on July 1st, 1913 is printed *in extenso* in the following pages. About 40 per cent. of the delegates present at the last conference were administrative, executive, or technical officials, acting for the postal telegraph and cable departments of the various countries represented. About another third of the assembly (37 per cent.) were composed of army and navy officers the relative ratio of naval and military officers being about 4 to 3. About 6 per cent. of the delegates were trained and experienced diplomats, and the remainder included eminent scientists, noted meteorologists, and prominent personages interested in the technical, commercial, and humanitarian development of wireless telegraphy.

The signing of the International Convention for the Safety of Life at Sea on January 20th, 1914, constituted a most noteworthy advance in the legislation relating to Wireless Telegraphy. The Convention was drawn up by an International Conference which met in London on November 12th, 1913, and laid down, *inter alia*, the minimum Wireless Telegraphy equipment to be carried by ships of different grades. For the purpose of defining the hours of service (*i.e.*, setting out the times when the various stations are to open for the receipt and transmission of messages) the Radiotelegraphic Convention, 1912, divided ship stations into three classes, but did not specify which vessels (by virtue of the services maintained on board) should be placed in the various classes. Under the provisions of the Safety of Life at Sea Convention which deal with Wireless Telegraphy, these classes are clearly defined.

In order to give effect to this International Convention, the British Government has amended the laws relating to merchant ships by the Merchant Shipping (Convention) Act, 1914, and the Merchant Shipping (Wireless Telegraphy) Act, 1919. Part III of the former deals with Wireless Telegraphy, and together with the 1919 Act, is reprinted under "*United Kingdom*," in the "*Laws and Regulations*" section of this book.

At the outbreak of the late war immediate steps were taken by the Governments of the belligerent countries to bring the use of Wireless Telegraphy under direct official control, and all stations not operated under Government supervision were ordered by the respective Governments to be dismantled.

This action, as might well have been expected, did not stop at the belligerent countries, but extended to neutral Governments almost all over the world. It was necessary that steps should be taken by non-belligerent powers to ensure that their neutrality obligations were not violated by the utilisation of wireless stations in their territory for the transmission of communications of a non-neutral character. Consequently, almost all countries throughout the world issued special regulations relating to the use of Wireless Telegraphy in war time. Most of these wartime measures have now been repealed, but such as remain in force will be found printed in the section of this book devoted to the Laws and Regulations of the World.

The central agency established for the purpose of collecting and distributing information in accordance with the requirements of the International Radiotelegraphic Convention is commonly known as the "Berne Bureau." This is merely a branch of the Bureau of the International Telegraph Union, situated at Berne, in Switzerland. It possesses neither powers for initiating new regulations nor for dealing with those already existing; its functions are practically entirely confined to the collection and circulation of information.

Notwithstanding this, the International Bureau at Berne has become an organisation of supreme importance, thanks to the zealous, economical and efficient manner in which it is conducted. To this organisation is entrusted the work of preparing and circulating, in accordance with Article 13 of the Convention, particulars regarding every station located in countries adhering to the Convention.

The normal supplementary expenses resulting from the work of the International Bureau in connection with radiotelegraphy must not exceed 80,000 francs per annum. This sum, however, does not include any special expenditure such as would be necessitated by the holding of an International Conference. For the purpose of fixing their respective contributions towards the expenses, the governing bodies of the contracting States are divided into six classes, as set forth in Article 43 of the regulations.

INTERNATIONAL RADIOTELEGRAPHIC CONVENTION

London, July 5th, 1912.

INTERNATIONAL Radiotelegraphic Convention concluded between Great Britain and various British Colonies and Protectorates,* Union of South Africa, Commonwealth of Australia, Canada, British India, New Zealand, Greece, Italy and Italian Colonies, Germany and Protectorates, United States of America and Possessions, Argentina, Austria, Hungary, Bosnia-Herzegovina, Belgium, Belgian Congo, Brazil, Bulgaria, Chili, Denmark, Egypt, France and Algeria, French West Africa, French Equatorial Africa, Greece, Indo-China, Madagascar, Tunis, Japan and Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung, Morocco, Monaco, Norway, Netherlands, Dutch Indies, Curaçoa, Persia, Portugal and Portuguese Colonies, Roumania, Russia and Russian Possessions and Protectorates, San Marino, Siam, Spain and Spanish Colonies, Sweden, Turkey and Uruguay.

The undersigned Plenipotentiaries of the Governments of the countries enumerated above, being assembled in Conference in London, have, by mutual consent, and subject to ratification, concluded the following Convention :—

ARTICLE 1.
Application of Provisions.

The High Contracting Parties undertake to apply the provisions of the present Convention at all the radiotelegraph stations (coast stations and ship stations) which are established or worked by the Contracting Parties and open for the service of public correspondence between the land and ships at sea.

They undertake, moreover to impose the observance of these provisions upon private enterprises authorised either to establish or to work radiotelegraphic coast stations open to the service of public correspondence between the land and ships at sea, or to establish or to work radiotelegraphic stations whether open or public correspondence or not on board the ships which carry their flag.

ARTICLE 2.
Interpretation of Terms.

The term coast station means radiotelegraphic station established on land or on board any ship permanently anchored and used for the exchange of correspondence with ships at sea.

The term ship station means any radiotelegraphic station established on board a ship other than a permanently moored ship.

ARTICLE 3.
Compulsory Interchange of Messages.

Coast stations and ship stations are bound to exchange radiotelegrams reciprocally without regard to the radiotelegraph system adopted by such stations.

Each ship station is bound to exchange radiotelegrams with any other ship station without distinction as to radiotelegraphic system adopted by such stations.

Nevertheless, in order not to impede scientific progress, the provisions of the present Article do not prevent the contingent employment of a radiotelegraphic system incapable of communicating with other systems, provided that such incapacity be due to the specific nature of such system and that it be not caused by devices adopted solely with the object of preventing inter-communication.

ARTICLE 4.
Restriction of Service.

Nothwithstanding the provisions of Article 3, a station may be appropriated to a restricted public service determined by the object of the correspondence or by other circumstances independent of the system employed.

ARTICLE 5.
Connection with Land Telegraph System.

Each of the High Contracting Parties undertakes to cause the coast stations to be connected with the telegraph system by means of special wires, or, at least, to take such other measures as will ensure a rapid exchange between the coast stations and the telegraph system.

ARTICLE 6.
Notification of Particulars.

The High Contracting Parties shall mutually notify one another of the names of the coast stations and ship stations covered by Article 1,

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* Barbados, Basutoland, Bermudas, Borneo, Ceylon, Cyprus, Gold Coast and Ashanti, Malay States (Perak, Selangor, Negri Sembilan, Pahang), Gambia, Gibraltar, British Guiana, British Honduras, Hong Kong, Bahama Islands, Windward Islands (Grenada, St. Lucia, St. Vincent), Falkland Islands, Fiji Islands, Jamaica, Turks and Caicos Islands, Cayman Islands, Leeward Islands (Antigua, Montserrat, St. Kitts-Nevis, Dominica, Virgin Islands), Malta, Mauritius, Northern and Southern Nigeria, Western Pacific Islands (Fanning Island, Gilbert and Ellice Islands, British Solomon Islands), East African Protectorate, Uganda, Bechuanaland, Nyassaland, British Somaliland, Northern and Southern Rhodesia, Seychelles, Sierra Leone, St. Helena, Straits Settlements (Labuan, Cocos Islands), Swaziland, Trinidad and Tobago, Wei-hai-wei.

as well as of all the particulars necessary to facilitate and accelerate the radiotelegraphic exchanges as specified in the Detailed Regulations.

ARTICLE 7.

Other Radiotelegraphic Arrangements.

Each of the High Contracting Parties reserves to itself the right to prescribe or to permit in the stations covered by Article 1—independently of the installation of which the particulars are published conformable to Article 6—the installation and working of other arrangements designed for special radiotelegraphic transmission without publication of the details of such devices.

ARTICLE 8.

Interference with Other Stations.

The working of radiotelegraphic stations shall be organised as far as possible in such a manner as not to interfere with the working of other stations of the kind.

ARTICLE 9.

Distress Calls.

Radiotelegraphic stations shall be obliged to accept with absolute priority calls of distress from whatever source, to reply in like manner to such calls, and to give the effect to them which they require.

ARTICLE 10.

Charges.

The charge for a radiotelegram shall include, according to the circumstances:—

1. (*a*) The "coast charge" which accrues to the coast station.

(*b*) The "ship charge" which accrues to the ship station.

2. The charge for transmission over the lines of the telegraph system, calculated in accordance with the ordinary rules.

3. The transit charges of the intermediate coast or ship stations and the charges appertaining to special services required by the sender.

The rate of the coast charge shall be subject to the approval of the Government to whose authority the coast station is subject, and the rate of the ship charge to the approval of the Government to which the ship belongs.

ARTICLE 11.

Validity and Modifications.

The provisions of the present Convention are completed by Detailed Regulations which have the same validity and come into force at the same time as the Convention.

The provisions of the present Convention and of the Regulations relating thereto may be modified at any time by mutual consent of the High Contracting Parties. Conferences of Plenipotentiaries having power to modify the Convention and the Regulations shall take place periodically; each Conference shall itself fix the place and time of the succeeding Conference.

ARTICLE 12.

Exercise of Voting Powers.

These Conferences shall be composed of Delegates of the Governments of the Contracting Parties.

In the deliberations each country shall have one vote only

If a Government adhere to the Convention or its colonies, possessions or protectorates, subsequent Conferences may determine that the whole or part of such colonies, possessions or protectorates is to be regarded as forming a country for the purposes of the foregoing clauses. But the number of votes to be exercised by a Government, including its colonies, possessions or protectorates, may not exceed six.

The following are regarded as forming a single country for the purposes of the present Article:—

The Union of South Africa.
The Australian Commonwealth.
Canada.
British India.
New Zealand.
Ex-German East Africa.
Ex-German South-West Africa.
The Cameroons.
Togoland.
The Ex-German Pacific Protectorates.
Alaska.
Hawaii and the other American possessions in Polynesia.
The Philippine Islands.
Porto Rico and the American possessions in the Antilles.
The zone of the Panama Canal.
The Belgian Congo.
The Spanish Colony of the Gulf of Guinea.
French West Africa.
French Equatorial Africa.
Indo-China.
Madagascar.
Tunisia.
Eritrea.
Italian Somaliland.
Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung.
The Dutch Indies.
The Colony of Curaçao.
Portuguese West Africa.
Portuguese East Africa and the Portuguese possessions in Asia.
Russian Central Asia (littoral of the Caspian Sea).
Bokhara.
Khiva.
Western Siberia (littoral of the Arctic Ocean).
Eastern Siberia (littoral of the Pacific Ocean).

ARTICLE 13.

Collection of Information.

The International Bureau of the Telegraph Union shall be entrusted with the duty of collecting, co-ordinating, and publishing information of every kind relating to radiotelegraphy; of circulating in proper form proposals for the modification of the Convention and of the Regulations; of notifying the changes adopted, and, generally, of carrying out any Administrative work which it may be called upon to undertake in the interests of International Radiotelegraphy.

The expenses of this institution shall be borne by all the Contracting Parties.

ARTICLE 14.

Conditions of Transmission and Receipt.

Each of the High Contracting Parties reserves to itself the right to fix the conditions under which it will admit radiotelegrams coming from or destined for a station, whether a ship station or a coast station, which is not subject to the provisions of the present Convention.

If a radiotelegram is admitted, the ordinary charges must be applied to it.

Every radiotelegram originating at a ship station and received by a coast station of the contracting country, or accepted in transit by the Administration of a contracting country, shall be sent forward.

Every radiotelegram intended for a ship shall also be sent forward if the Administration of the contracting country has accepted it from the sender, or if the Administration of a contracting country has accepted it in transit from a non-contracting country, subject to the right of the coast station to refuse transmission to a ship station belonging to a non-contracting country.

ARTICLE 15.

Further Applications.

The provisions of the Articles 8 and 9 of this Convention are equally applicable to radiotelegraphic installations other than those indicated in Article 1.

ARTICLE 16.

Admission of New Parties.

Governments which have not taken part in the present Convention shall be allowed to become party to it at their own request.

Such adherence shall be notified through diplomatic channels to that one of the contracting Governments in whose territory the last Conference was held, and by that Government to the others.

Such adherence shall involve complete acceptance of all the clauses of the present Convention and admission to all the advantages stipulated therein.

The adherence to the Convention of the Government of a country having colonies, possessions, or protectorates shall not carry with it the adherence of the colonies, possessions, or protectorates of such Government, unless a declaration be made to that effect by such Government. These colonies, possessions, or protectorates as a whole, or each one of them separately, may form the subject of a separate adherence or of a separate denunciation under the conditions indicated in the present Article and in Article 22.

ARTICLE 17.

Application of International Telegraph Convention of 1875.

The provisions of Articles 1, 2, 3, 5, 6, 7, 8, 11, 12, and 17, of the International Telegraph Convention of St. Petersburg (Petrograd) dated 10/22 July, 1875, shall be applicable to International Radiotelegraphy.

ARTICLE 18.

Arbitration.

In cases of difference of opinion between two or more contracting Governments concerning the interpretation or the execution either of the present Convention or of the Regulations provided for by Article 11, the question at issue may, by mutual consent, be submitted to arbitration. In that event each of the Governments concerned shall choose another not interested in the question.

The decision of the Arbitrators shall be made by an absolute majority of votes.

In the event of an equality of votes, the Arbitrators shall appoint, in order to settle the difficulty, another Contracting Government not concerned in the question in dispute. In default of an agreement with regard to such choice, each Arbitrator shall propose a Contracting Government not interested in the dispute; and lots shall be drawn as between the Governments proposed. The drawing of lots shall be the prerogative of the Government in whose territory the International Bureau provided for in Article 13 performs its work.

ARTICLE 19.

Legislative Measures.

The High Contracting Parties undertake to adopt or to propose to their respective legislatures the measures necessary to ensure the execution of the present Convention.

ARTICLE 20.

Communication between Contracting Parties.

The High Contracting Powers shall communicate to one another such laws as may have been already enacted or which may be about to be so enacted in their countries, relating to the subject of the present Convention

ARTICLE 21.

Freedom of Action.

The High Contracting Parties maintain their entire liberty concerning the radiotelegraphic installation not covered by Article 1, and particularly with regard to naval and military installations, and also to stations carrying out communications between fixed points. All such installations and stations shall remain subject solely to the obligations provided for in Articles 8 and 9 of the present Convention.

Nevertheless, when these installations and stations carry out an exchange of maritime public correspondence, they shall conform, in carrying out such service, to the requirements of the Regulations so far as concerns the method of transmission and accounting.

If, on the other hand, coast stations carry out, at the same time as public correspondence with ships at sea, communications between fixed points, they shall not be subject, in the execution of this latter service, to the provisions of the Convention, except as to the observance of Articles 8 and 9 of this Convention.

However, fixed stations which carry out correspondence between land and land must not refuse the exchange of radiotelegrams with another fixed station on account of the system adopted by such station; nevertheless, the liberty of each country shall remain complete in respect of the organisation of the service for correspondence between fixed points and the decision as to the correspondence to be carried out by the stations appropriated to such service.

ARTICLE 22.

Date of Operation.

The present Convention shall come into execution on and from the 1st July, 1913, and shall remain in force for an indeterminable period and until the expiry of one year from the day upon which it is denounced.

Denunciation shall only take effect as regards the Government in whose name it is made. So far as the other Contracting Parties are concerned, the Convention shall remain in force.

ARTICLE 23.

Ratification.

The present Convention shall be ratified, and the ratification thereof shall be deposited in London with as little delay as possible.

If one or more of the High Contracting Parties shall not ratify the Convention, it shall not be less valid thereby for the parties which have ratified it.

In witness whereof the respective Plenipotentiaries have signed the Convention in a single copy, which shall remain deposited in the archives of the British Government, and of which a copy shall be sent to each Party.

London, the 5th of July, 1912.

FINAL PROTOCOL.

At the time of proceeding to the signature of the Convention adopted by the International Radiotelegraphic Conference of London, the undersigned Plenipotentiaries have agreed as follows:—

I.

The exact nature of the adherence notified on the part of Bosnia-Herzegovina not being yet determined, it is recognised that Bosnia-Herzegovina is entitled to a vote, a decision at a later date being necessary on the question whether this vote belongs to Bosnia-Herzegovina in virtue of the second paragraph of Article 12 of the Convention, or whether this vote is accorded to it conformably to the provisions of the third paragraph of that Article.

II.

The following declaration is placed on record:—

The Delegation of the United States declares that its Government is under the necessity of abstaining from all action with regard to tariffs, because the transmission of radiotelegrams as well as of telegrams in the United States is undertaken, wholly or in part, by commercial or private companies.

III.

The following declaration was also placed on record:—

The Government of Canada reserves to itself the right to fix separately, for each of its coast stations, a total sea charge for radiotelegrams originating from North America and intended for any ship whatever, the coast charge amounting to three-fifths and the ship charge to two-fifths of such total charge.

In witness whereof the respective Plenipotentiaries have drawn up the present Final Protocol, which shall have the same force and the same validity as if the provisions thereof had been inserted in the text itself of the Convention to which it belongs, and they have signed it in a single copy which shall remain deposited in the archives of the British Government, and of which a copy shall be sent to each party.

London, the 5th of July, 1912.

SERVICE REGULATIONS ANNEXED TO THE INTERNATIONAL RADIOTELEGRAPHIC CONVENTION.

CONTENTS.

I.—ORGANISATION OF RADIOTELEGRAPHIC STATIONS.

I.

Choice of Apparatus.

The choice of radiotelegraphic apparatus and devices to be used by coast stations and ship stations is free. The installation of these stations must, as far as possible, be in keeping with scientific and technical progress.

II.

Wavelength.

Two wavelengths, one of 600 and the other of 300 metres, shall be admitted for the service of general public correspondence. Every coast station open to this service must be equipped in such a way as to be able to use these two wavelengths, of which one shall be designated as the normal wavelength of a station. During the whole time that it is open

every coast station must be in a position to receive calls made by means of its normal wavelength. Nevertheless, for the correspondence covered by paragraph 2 of Regulation XXXV, use shall be made of a wavelength of 1,800 metres. Further, each Government may authorise the use, in a coast station, of other wavelengths for the purpose of securing a long-range service or a service other than that of general public correspondence, and established in conformity with the provisions of the Convention, with the reservation that these wavelengths do not exceed 600 metres, or that they do exceed 1,600 metres.

In particular, stations used exclusively for the despatch of signals intended to determine the position of ships must not use wavelengths exceeding 150 metres.

III.

Equipment.

1. Every ship station must be equipped in such a way as to be able to use the wavelengths of 600 metres and of 300 metres. The first shall be the normal wavelength, and may not be exceeded in transmission, the case of Regulation XXXV (paragraph 2) excepted.

Use may be made of other wavelengths not exceeding 600 metres in special cases, and subject to the approval of the Administrations to which the coast stations and ship stations concerned are subject.

2. During the whole time that it is open every ship station must be able to receive calls made by means of its normal wavelength.

3. Ships of small tonnage, in the case of which it would be materially impossible to use the wavelength of 600 metres for transmission, may be authorised to employ exclusively the wavelength of 300 metres; they must be able to receive by means of the wavelength of 600 metres.

IV.

Communication.

Communications between a coast station and a ship station, or between two ship stations, must be exchanged on both sides by means of the same wavelength. If, in a particular case, communication is difficult, the two stations may, by mutual consent, pass from the wavelength by means of which they are communicating to the other regulation wavelength. Both stations shall resume their normal wavelengths when the radiotelegraphic exchange is finished.

V.

Map and Nomenclature.

1. The International Bureau shall prepare, publish and revise periodically an official map showing the coast stations, their normal ranges, the principal lines of navigation, and the time normally taken by ships for the voyage between the various ports of call.

2. It shall draw up and publish a Nomenclature of the radiotelegraphic stations covered by Article 1 of the Convention, and also periodical supplements for additions and modifications. This Nomenclature shall give, in the case of each station, the following information:—

1st.—For coast stations: the name, nationality, and geographical position indicated by the territorial subdivision and by the longitude and latitude of the place; for ship stations: the name and nationality of the ships; when the case arises, the name and address of the contractor.

2nd.—The call signal. (The call signals must be differentiated from one another, and each one must consist of a group of three letters.)

3rd.—The normal range.

4th.—The radiotelegraphic system with the characteristics of the system of discharge (musical sparks, tone expressed by the number of double vibrations, etc.).

5th.—The wavelengths used (the normal wavelength to be underlined).

6th.—The nature of the services performed.

7th.—The hours of working.

8th.—When necessary the hour and method of despatch of time signals and meteorological telegrams.

9th.—The coast or ship charge.

3. There shall also be included in the Nomenclature such information relating to radiotelegraphic stations other than those covered by Article 1 of the Convention, as shall be communicated to the International Bureau by the Administrations to which such stations are subject, provided that these are either Administrations which are parties to the Convention, or, if they are not parties to it, have made the declaration provided for in Regulation XLVIII.

4. The following notations shall be adopted in documents for the use of the international service to designate radiotelegraph stations:—

PG—station open for general public correspondence.

PR—Station open for restricted public correspondence.

P—private station.

O—station open only for official correspondence.

N—station always open.

X—station not having fixed working hours.

5. The name of a ship station indicated in the first column of the Nomenclature must be followed, when there is duplication of the name, by the call-signal of such station.

VI.

Experiments and Practice.

The exchange of unnecessary signals and words is forbidden to the stations covered by Article 1 of the Convention. Experiments and practice shall not be allowed in these stations, except so far as they do not disturb the service of other stations.

Practice must be carried out with wavelengths different from those allowed for public correspondence, and with the minimum of power necessary.

VII.

Compulsory Conditions.

1. All stations are bound to exchange traffic with the minimum of energy necessary to ensure good communication.

2. Every coast and ship station must comply with the following conditions:—

(*a*) The waves emitted must be as pure and as little damped as possible.

In particular, the use of transmitting devices in which the production of the waves emitted is obtained by discharging the aerial direct by sparks (plain aerial) shall not be allowed except in cases of distress.

It may, however, be allowed in the case of certain special stations (for example, those of small ships) in which the primary power does not exceed 50 watts.

(*b*) The apparatus must be capable of transmitting and receiving at a speed at least equal

to 20 words per minute, the word being reckoned at the rate of five letters.

New installations bringing into play an energy of more than 50 watts shall be equipped in such a way that it may be possible to obtain easily several ranges less than the normal range, the shortest being of approximately 15 nautical miles. Installations already established bringing into play an energy of more than 50 watts shall be transformed as far as possible in such a manner as to satisfy the foregoing requirements.

(c) Receiving apparatus must allow of receiving, with the greatest possible amount of protection from disturbance, transmissions made with the wavelengths specified in present Regulations, up to 600 metres.

3. Stations serving solely for determining the position of ships (*radiophares*) must not operate over an area of greater radius than 30 nautical miles.

VIII.

Power.

Independently of the general conditions specified in Regulation VII, ship stations must also satisfy the following conditions:—

(*a*) The power transmitted to the radiotelegraphic apparatus, measured at the terminals of the generator of the station, must not under normal circumstances exceed one kilowatt.

(*b*) Subject to the provisions of Regulation XXXV, par. 2, a power exceeding one kilowatt may be used if the ship is under the necessity of corresponding at a distance of more than 200 nautical miles from the nearest coast station, or if, in consequence of exceptional circumstances, communication cannot be realised except by means of an increase of power.

IX.

Licenses.

1. No ship station may be established or worked by private enterprise without a license issued by the Government to which the ship is subject.

Stations on board ship having their port of register in a colony, possession, or protectorate may be described as being subject to the authority of such colony, possession, or protectorate.

2. Every ship station holding a license issued by one of the contracting Governments must be regarded by the other Governments as having an installation fulfilling the conditions imposed by the present Regulations.

The competent authorities of the countries where the ship calls may demand the production of the license. In default of such production, these authorities may ascertain whether the radiotelegraph installations of the ship satisfy the conditions imposed by the present Regulations.

When an Administration has practical evidence that a ship station is not fulfilling these conditions, it must, in every case, address a complaint to the Administration of the country to which the ship is subject. From that point onwards the procedure shall be, when necessary, as provided in Regulation XII, paragraph 2.

X.

Certificates.

1. The service of the ship station must be carried out by a telegraphist holding a certificate issued by the Government to which the ship is subject, or, in an emergency and for one voyage only, by another Government party to the convention.

2. There shall be two classes of certificates:—

The first-class certificate shall state the professional qualifications of the operator with regard to:—

(*a*) the adjustment of the apparatus and knowledge of their working;

(*b*) transmitting and receiving by ear at a speed which must not be less than 20 words per minute;

(*c*) knowledge of the regulations applying to the exchange of radiotelegraphic communications.

The second-class certificate may be issued to a telegraphist who only attains to a speed in transmitting and receiving of 12 to 19 words per minute, but who fulfils the other conditions mentioned above. Telegraphists holding a second-class certificate may be allowed:—

(*a*) on ships only using radiotelegraphy for their own service and for the correspondence of the ship's company, in particular on fishing vessels;

(*b*) on all ships as substitutes, provided that such ships have on board at least one operator holding a first-class certificate. Nevertheless, on ships placed in the first class indicated in Regulation XIII, the service must be carried out by at least two telegraphists holding first-class certificates.

In ship stations, transmissions may only be made by a telegraphist holding a first or second-class certificate, an exception being made in cases of emergency, in which it would be impossible to conform to this provision.

3. Further, the certificate shall testify that the Government has placed the telegraphist under the obligation of preserving the secrecy of correspondence.

4. The radiotelegraph service of the ship station shall be placed under the supreme authority of the captain of the ship.

XI.

Emergency Equipment.

Ships provided with radiotelegraph installations and placed in the first two classes indicated in Regulation XIII shall be bound to have emergency radiotelegraph installations of which all the parts shall be placed in conditions of the greatest safety possible, such conditions to be determined by the Government which issues the licence. These emergency installations must have at command a source of power of their own, must be capable of being set working speedily, must be able to work for six hours at least, and must have a minimum range of 80 nautical miles in the case of ships in the first class, and of 50 miles in the case of those of the second class. This emergency installation shall not be required in the case of ships whose ordinary installation fulfils the conditions of the present article.

XII.

Responsibility for Breach of the Convention.

1. If an Administration has information of a breach of the Convention or of the Regulations committed in one of the stations which it has authorised, it shall ascertain the facts and fix the responsibility.

In the case of ship stations, if the responsibility rests on the operator, the Administration shall take the necessary steps, and, if necessary, shall withdraw the certificate. If it is shown that the breach was due to the condition of the

apparatus or to instructions given to the telegraphist, the same procedure shall be followed in respect of the license issued to the ship.

2. In the event of repeated breaches by the same ship, if the representations made to the Administration to which the ship is subject, by another Administration, remain without effect, the latter shall have the right, after notice given, of authorising its coast stations not to accept communications coming from the ship in question. In case of a difference between the two Administrations the questions shall be submitted to arbitration on the request of one of the Governments concerned. The procedure is indicated in Article XVIII of the Convention.

II.—HOURS OF SERVICE OF STATIONS.

XIII.

Land and Ship Stations.

(a) *Coast Stations.*

1. The service of coast stations shall be, as far as possible, permanent, day and night, without interruptions.

Nevertheless, certain coast stations may have a service of limited duration. Each Administration shall fix the hours of service.

2. Coast stations whose service is not permanent may not close before having transmitted all their radiotelegrams to the ships which are in their radius of action nor before having received from such ships all the radiotelegrams of which notice has been given. This provision shall also apply when ships notify their presence before work has actually ceased.

(b) *Ship Stations.*

3. Ship stations shall be placed in three classes:—

(1st) Stations always open;

(2nd) stations having limited working hours;

(3rd) stations having no fixed working hours.

During navigation, the following must remain permanently on the watch: (1st) ships of the first class; (2nd) those of the second class, during the hours that they are open for service; out of these hours, the latter stations must remain on the watch for the first 10 minutes of each hour. The stations of the third class are not bound to perform any regular "listening" service.

It shall fall to the Governments which issue the licenses specified in Article IX to fix the class in which the ship is to be placed in respect of its obligations in the matter of keeping watch. This classification shall be mentioned in the licence.

III.—DRAWING UP AND HANDING IN OF RADIO-TELEGRAMS.

XIV.

Transmission from Ship to Land.

1. Radiotelegrams shall bear, as the first word of the preamble, the service instructions "radio."

2. In the transmission of radiotelegrams coming from a ship at sea, the date and the hour of the handing in at the ship station shall be indicated in the preamble.

3. On forwarding over the telegraph system, the coast station shall insert, as the indication of the office of origin, the name of the ship of origin as it appears in the Nomenclature, and also, when the case arises, that of the last ship which served as an intermediary. These particulars shall be followed by the name of the coast station.

XV.

Transmission from Land to Ship.

1 The address of radiotelegrams intended for ships must be as complete as possible. It shall be compulsorily drawn up as follows:—

(*a*) Name or title of the addressee, with supplementary particulars if necessary.

(*b*) Name of the ship, as it appears in the first column of the Nomenclature.

(*c*) Name of the coast station, as it appears in the Nomenclature.

Nevertheless the name of the ship may be replaced, at the risks and perils of the sender, by the particulars of the voyage taken by such ship and determined by the names of the ports of origin and destination or by any other equivalent particulars.

2. In the address, the name of the ship, as it appears in the first column of the Nomenclature, shall be counted in every case, and independently of its length, as one word.

3. Radiotelegrams drawn up by means of the International Signal Code shall be forwarded to their destination without being de-coded.

IV.—CHARGES.

XVI.

Coast and Ship Charges.

1. The coast charge and the ship charge shall be fixed in accordance with the tariff per word pure and simple, on the basis of a fair remuneration for radiotelegraphic work, with optional application of a minimum charge per radiotelegram.

The coast charge may not exceed 60 centimes per word, nor the ship charge 40 centimes per word. Nevertheless each Administration shall have the right to authorise coast and ship charges higher than these maxima in the case of stations having a range of more than 400 nautical miles, or of stations exceptionally onerous on account of the material conditions of their installation or working.

The optional minimum charge per radiotelegram may not exceed the coast or ship charge for a radiotelegram of 10 words.

2. In the case of radiotelegrams originating from or intended for a country or exchanged directly with the coast stations of that country, the charge applying to the transmission over the lines of the telegraph system must not exceed, on the average, that of the inland rate of that country.

This charge shall be reckoned per word pure and simple, with an optional minimum charge not exceeding the charge for 10 words. It shall be notified in francs by the Administration of the country to which the coast station is subject.

In the cases of countries in the European system, with the exception of Russia and Turkey, there shall only be a single charge for the territory of each country.

XVII.

Retransmission.

1. When a radiotelegram originating from a ship and intended for *terra firma* passes through one or two ship stations, the charge shall include, in addition to those of the ship of

origin, the coast station, and the telegraph system, the ship charge of each of the ships taking part in the transmission.

2. The sender of a radiotelegram originating from *terra firma* and intended for a ship may require that his message be transmitted by way of one or two ship stations; he shall deposit for this purpose the amount of the radiotelegraphic and telegraphic charges, and besides, as a deposit, a sum to be fixed by the office of origin with a view to the payment to the intermediate ship stations of the transit charges fixed in paragraph 1; he must further pay, as he may choose, either the charge for a telegram of five words or the cost of postage of a letter to be sent by the coast station to the office of origin giving the information necessary to the liquidation of the sum deposited.

The radiotelegram shall then be accepted at the risks and perils of the sender; it shall bear before the address the paid additional particulars "x retransmissions telegraphe" or "x retransmissions lettre" (x representing the number of retransmissions required by the sender) accordingly as the sender desires that the information necessary for the liquidation of the deposit be furnished by telegram or by letter.

3. The charge for radiotelegrams originating from a ship, intended for another ship, and sent by way of one or two intermediate coast stations, shall include:—

The ship charges of both ships, the charge of the coast station or the two coast stations, as the case may be, and when necessary the telegraph charge appropriate to the transit between the two coast stations.

4. The charge for radiotelegrams exchanged between ships without the aid of a coast station includes the ship charges of the ship of origin and of the ship of destination, with the ship charges of the intermediate stations added thereto.

5. The coast and ship charges due to the stations of transit shall be the same as those fixed for such stations when these are stations of origin and destination. In no case shall they be collected more than once.

6. In the case of any intermediate coast station, the charge to be collected for the transit service shall be the highest of the coast charges appertaining to the direct exchange with the two ships in question.

XVIII.

Origin of Telegrams.

The country in whose territory is established a coast station acting as intermediary for the exchange of radiotelegrams between a ship station and another country shall be regarded, for the purpose of applying telegraphic charges, as the country of origin or of destination of such radiotelegrams and not as the country of transit.

V.—COLLECTION OF CHARGES.

XIX.

Tariffs.

1. The total charge for radiotelegrams shall be collected from the sender, with the exception—1st, of the cost of express delivery (Article LVIII, paragraph 1, of the Telegraph Regulations); 2nd, of the charges applying to inadmissible joinings or alterations of words noted by the office or station of destination (Article XIX, paragraph 9, of the Telegraph Regulations), these charges being collected from the addressee.

Ship stations must possess the necessary tariffs for this purpose. They shall have, however, the right to obtain information from coast stations with regard to charges for radiotelegrams for which they do not possess all the necessary information.

2. The counting of words by the office of origin shall be decisive in the case of radiotelegrams addressed to ships, and that of the ship station of origin shall be decisive in the case of radiotelegrams originating in ships, both for the purpose of transmission and for that of the international accounts. Nevertheless when the radiotelegram is worded wholly or in part either in one of the languages of the country of destination, in the case of radiotelegrams originating in ships, or in one of the languages of the country to which the ship belongs, in the case of radiotelegrams addressed to ships, and when the radiotelegram contains joinings or alterations of words contrary to the common use of that language, the office or ship station of destination, as the case may be, shall have the right to recover from the addressee the amount of the charge not collected. In the case of a refusal to pay the radiotelegram may be withheld.

VI.—TRANSMISSION OF RADIOTELEGRAMS.

(A) SIGNALS OF TRANSMISSION.

XX.

Code.

The signals employed shall be those of the International Morse Code.

XXI.

Distress Signals.

Ships in distress shall make use of the following signal.

● ● ● ▬ ▬ ▬ ● ● ●

repeated at short intervals, followed by the necessary particulars.

As soon as a station hears the signal of distress, it must suspend all correspondence and must not resume the same until after it has made sure that the communication consequent upon the call for help is finished.

The stations that hear a call of distress must act according to indications given by the ship which makes the call, with regard to the order of messages or their cessation.

When, at the end of a series of distress calls, there is added the call signal of the particular station, the reply to the call is proper to that station only, unless that station does not reply. Failing the indication of a particular station in the call for help, every station that hears the call shall be bound to reply thereto.

XXII.

Information.

For the purpose of giving or asking information concerning the radiotelegraph service, stations must make use of the signals contained in the list appended to the present Regulations. (See p. 62.)

(B) ORDER OF TRANSMISSION.

XXIII.

Duration of Transmission.

Between two stations, radiotelegrams of the same class shall be transmitted singly in

alternate order or by series of several radiotelegrams, according to the instructions given by the coast station, on condition that the duration of the transmission of each series does not exceed 15 minutes.

(c) CALLING OF STATIONS AND TRANSMISSION OF RADIOTELEGRAMS.

XXIV.

Calls.

1. As a general rule, it shall be the ship station that calls the coast station, whether it has radiotelegrams to transmit or not.

2. In waters where the radiotelegraphic traffic is congested (the Channel, etc.), the call of a ship to a coast station may not, as a general rule, be made unless the latter is within the normal range of the ship station and the ship station has approached to a distance less than 75 per cent. of the normal range of the coast station.

3. Before proceeding to make a call, the coast station or the ship station must adjust its receiving system to the highest possible degree of sensitiveness, and must make sure that no other communication is being made within its radius of action; if it is otherwise, it shall await the first break, unless it finds that its call is not likely to disturb the communication in progress. The same applies when the station wishes to answer a call.

4. For making a call every station shall use the normal wave of the station to be called.

5. If, in spite of these precautions, a radiotelegraphic transmission be impeded, the call must cease on the first request made by a coast station open to public correspondence. This station must then indicate the approximate duration of the wait.

6. The ship station must make known to each coast station to which it has notified its presence the time at which it proposes to cease as operations, and also the probable duration of the interruption.

XXV.

Call Signals.

1. The call comprises the signal ▬ ● ▬ ● ▬, the call signal of the station, called, sent three times, and the word "de," followed by the call signall of the sending station, sent three times.

2. The station callec shall reply by giving the signal ▬ ● ▬ ● ▬, followed by the call signall sent three times, of the calling station, by the word "de," its own call signal and the signal ▬ ● ▬

3. Stations which wish to enter into communication with ships, without, however, knowing the names of those ships which are within their radius of action may use the signal ▬ ● ▬ ● ▬▬ ● ▬ (signal of enquiry). The provisions of paragraphs 1 and 2 are also applicable to the transmission of the signal of enquiry and to the reply to that signal.

XXVI.

Station failing to Reply.

If a station when called does not reply when the call (Regulation XXV) has been sent three times at intervals of 2 minutes, the call may not be resumed until after an interval of 15 minutes, the station making the call first making sure of the fact that no radiotelegraphic communication is in progress.

XXVII.

Use of High Power.

Every station which has to make a transmission necessitating the use of high power shall first send out three times the warning signal ▬▬ ● ● ▬▬, with the minimum of power necessary to reach the neighbouring stations. It shall not then begin to transmit with the high power until 30 seconds after sending the warning signal.

XXVIII.

Particulars regarding Reception.

1. As soon as the coast station has replied, the ship station shall furnish it with the following information if it has messages to transmit to it; this information shall also be given when the coast stations ask for it:—

(*a*) The approximate distance, in nautical miles, of the vessel from the coast station;

(*b*) The position of the ship given in a concise form and adapted to the circumstances of the individual case;

(*c*) The next port at which the ship will touch;

(*d*) The number of radiotelegrams if they are of normal length or the number of words if the messages are of exceptional length.

The speed of the ship in nautical miles shall be given specially at the express request of the coast station.

2. The coast station shall reply giving, as provided in paragraph 1, either the number of telegrams or the number of words to be transmitted to the ship and also the order of transmission.

3. If transmission cannot take place immediately the coast station shall inform the ship station of the approximate length of the wait.

4. If a ship station when called cannot receive for the moment it shall inform the calling station of the approximate length of the wait.

5. In the case of exchanges between two ship stations it shall rest with the station called to fix the order of transmission.

XXIX.

Exchange of Messages.

When a coast station is called by several ship stations, it shall decide the order in which these stations shall be allowed to exchange their messages.

In the regulation of this order, the coast station shall be guided solely by the necessity for allowing every station concerned to exchange the greatest possible number of radiotelegrams.

XXX.

Order of Transmission.

Before beginning to exchange correspondence, the coast station shall inform the ship station whether the transmission is to be made in alternate order by series (Regulation XXIII); it shall then begin to transmit, or shall follow up these instructions by the signal ▬ ● ▬

XXXI

Initial and Final Signals.

The transmission of a radiotelegram shall be preceded by the signal ▬ ● ▬ ● ▬ and ended by the signal ● ▬ ● ▬ ● followed by the call signal of the sending station and by the signal ▬ ● ▬

In the case of a series of radiotelegrams the call-letter of the sending station and the signal ▬ ● ▬ shall only be given at the end of the series.

XXXII.

Lengthy Messages.

When the radiotelegram to be transmitted contains more than 40 words, the sending

station shall interrupt the transmission by the signal ● ● ▬ ▬ ● ● after each series of 20 words or thereabouts, and it shall not resume transmission until after having obtained from the station in correspondence the repetition of the last word clearly received, followed by the said signal, or, if the reception is clear, the signal ▬ ● ▬.

In the case of transmission in series, the acknowledgment of receipt shall be given after each radiotelegram.

Coast stations engaged in transmitting long radiotelegrams must suspend transmission at the end of each period of 15 minutes, and must remain silent during a period of 3 minutes before continuing transmission.

Coast and ship stations which work in the conditions laid down in Regulation XXXV, paragraph 2, must suspend work at the end of each period of 15 minutes, and keep watch on the wavelength of 600 metres during a period of 3 minutes before continuing transmission.

XXXIII.

Doubtful Messages.

1. When the signals become doubtful, all possible resources must be drawn upon to accomplish transmission. To this end, the radiotelegram shall be transmitted three times at most, at the request of the receiving station. If in spite of this triple transmission the signals are still unintelligible, the radiotelegram shall be cancelled.

If the acknowledgment of receipt does not come to hand, the sending station shall again call the station with which it is in correspondence. When no reply is made after three calls, the transmission shall not be persevered with. In such case, the sending station shall have the right to obtain the acknowledgment of receipt through the medium of another radiotelegraph station, using, when necessary, the lines of the telegraph system.

2. If the receiving station considers that, in spite of defective receiving, the radiotelegram can be delivered, it shall insert at the end of the preamble the service advice "Reception douteuse," and shall forward the radiotelegram. In such case, the Administration to which the coast station is subject shall claim the charges, in conformity with Clause XLII of the present Regulations. Nevertheless, if the ship station later on transmits the radiotelegram to another coast station of the same Administration, the latter can only claim the charges appertaining to a single transmission.

(D) Acknowledgment of Receipt and End of Work.

XXXIV.

Acknowledgment of Reception and Completion.

1. The acknowledgment of receipt shall be given in the form prescribed by the International Telegraph Regulations; it shall be preceded by the call signal of the sending station and followed by the call signal of the receiving station.

2. The end of the work between two stations shall be indicated by each one of them by means of the signal ● ● ● ▬ ● ▬ followed by its own call signal.

(E) Route to be Taken by Radiotelegrams.

XXXV.

Route of Transmission.

1. As a general principle, the ship station shall transmit its radiotelegrams to the nearest coast station.

However, if the ship station has the choice between several coast stations at equal or nearly equal distances, it shall give the preference to that which is established on the territory of the country of destination or of normal transit of its radiotelegrams.

2. Nevertheless, a sender on board a ship shall have the right to indicate the coast station by which he wishes his radiotelegram to be forwarded. The ship station shall then wait until this coast station is the nearest.

Exceptionally, transmission may be made to a more distant coast station, provided :—

(*a*) that the radiotelegram is intended for the country in which such coast station is situated and that it comes from a ship subject to that country ;

(*b*) that for calls and transmission both stations use a wavelength of 1,800 metres ;

(*c*) that transmission by this wavelength does not disturb any transmission made, by means of the same wavelength, by a nearer coast station ;

(*d*) that the ship station is more than 50 nautical miles distant from any coast station shown in the Nomenclature. The distance of 50 miles may be reduced to 25 miles, subject to the reservation that the maximum power at the terminals of the generator do not exceed 5 kilowatts and that the ship stations be established in conformity with Regulations VII and VIII. This reduction of distance shall not apply in the seas, bays, or gulfs of which the shores belong to one country only, and of which the opening to the high sea is less than 100 miles wide.

VII.—DELIVERY OF RADIO-TELEGRAMS.

XXXVI.

Delivery.

When for any cause whatsoever a radiotelegram coming from a ship at sea and intended for *terra firma* cannot be delivered to the addressee, an advice of non-delivery shall be sent out. This advice shall be transmitted to the coast station which received the original radiotelegram. The latter, after verifying the address, shall forward the advice to the ship, if possible, and, if need be, by way of another coast station of the same country or of a neighbouring country.

When a radiotelegram, having arrived at the ship station, cannot be delivered, that station shall inform the office or ship station of origin by means of a service advice. In the case of radiotelegrams coming from *terra firma* this advice shall be transmitted, whenever possible, to the coast station by way of which the radiotelegram passed, or, if necessary, to another coast station of the same country or of a neighbouring country.

XXXVII.

Non-delivery.

If the ship to which the radiotelegram is addressed has not notified its presence to the coast station within the time specified by the sender, or, in the absence of such specification, up to the morning of the eighth day following, such coast station shall give notice of the fact to the office of origin, which shall inform the sender of the same.

This latter shall have the option of requiring by paid service advice, telegraphic or postal, addressed to the coast station, that his radiotelegram be kept for a fresh period of nine days

for transmission to the ship, and so on. In the absence of such request the radiotelegram shall be returned as undelivered at the end of the ninth day (the day of handing in not to be included).

However, if the coast station is sure that the ship has left its radius of action before the station could have transmitted the radiotelegram to it, such station shall immediately inform the office of origin, which shall without delay advise the sender of the cancellation of the message. Nevertheless, the sender may, by paid service advice, request the coast station to transmit the radiotelegram when the ship next passes.

VIII.—SPECIAL RADIOTELEGRAMS.

XXXVIII.

Special Messages.

The following only shall be allowed :—

1st, *Reply Paid Radiotelegrams.*—These radiotelegrams shall bear, before the address, the indication, "Réponse payée," or "RP," completed by the mention of the amount paid in advance for the reply—for example : "Réponse payée fr. x," or "Rp. fr. x."

The reply voucher issued on board a ship shall give the right to send, up to the limit of its value, a radiotelegram to any address whatever from the ship station which issues such voucher.

2nd, *Collated Radiotelegrams.*

3rd, *Express Delivery Radiotelegrams.*—But only in cases in which the amount of the cost of express delivery is collected from the addressee. The countries which cannot adopt these radiotelegrams must notify the fact to the International Bureau. Radiotelegrams for express delivery, with collection of the cost from the sender, may be allowed when they are intended for the country in whose territory the corresponding coast station is situated.

4th, *Radiotelegrams for Delivery by Post.*

5th, *Multiple Radiotelegrams.*

6th, *Radiotelegrams with Acknowledgment of Receipt.*—But only with regard to notification of the date and time at which the coast station has transmitted to the ship station the telegram addressed to the latter.

7th, *Paid Service Advices.*—Except those asking for repetition of information. Nevertheless, all paid service advices shall be allowed on the route over the telegraph lines.

8th, *Urgent Radiotelegrams.*—But only in transmission over the telegraph lines, and subject to the application of the International Telegraph Regulations.

XXXIX.

Postal Radiotelegrams.

Radiotelegrams may be transmitted by a coast station to a ship, or by a ship to another ship, with the object of being forwarded by post, the posting to take place from a port of call of the receiving ship.

The address of these radiotelegrams must be drawn up as follows :—

1st, Paid instruction "poste," followed by the name of the port where the radiotelegram is to be posted ;

2nd, Full name and address of the addressee ;

3rd, Name of the ship station which is to carry out the posting :

4th, When necessary, name of the coast station.

Example :—Poste Buenos Aires, Martinez, 14 Calle Prat, Valparaiso, Avon Lizard.

The charge shall include, as well as the radiotelegraph and telegraph charges, a sum of 25 centimes for the postage of the radiotelegram.

IX.—ARCHIVES.

XL.

Records.

The originals of radiotelegrams, as well as the documents relating thereto, retained by the Administrations, shall be kept with all necessary precautions in respect of secrecy for at least fifteen months, counting from the month following that in which the radiotelegrams were handed in.

These originals and documents shall be sent, as far as possible, at least once a month by the ship stations to the Administrations to which they are subject.

X.—REFUNDS AND REIMBURSEMENTS.

XLI.

Refund of Charges.

With regard to refunds and reimbursements, the provisions of the International Telegraph Regulations shall apply, bearing in mind the restrictions laid down in Clauses XXXVIII and XXXIX of the present Regulations and subject to the following reservations :—

The time occupied in radiotelegraphic transmission, and also the time during which the radiotelegram remains at the coast station in the case of radiotelegrams addressed to ships, or in the ship station in the case of radiotelegrams originating in ships, shall not be counted in the period of delay giving rise to refunds and reimbursements.

If the coast station informs the office of origin that a radiotelegram cannot be transmitted to the ship to which it is addressed, the Administration of the country of origin shall immediately initiate the reimbursement to the sender of the coast and ship charges in respect of such radiotelegram. In this case, the charges reimbursed shall not appear in the account for which provision is made by Regulation XLII, but the radiotelegram shall be mentioned therein as a memorandum.

Reimbursements shall be borne by the various Administrations and private enterprises which have taken part in the forwarding of the radiotelegram, each one of them relinquishing its share of the charge. Nevertheless, radiotelegrams falling under the provision of Articles VII and VIII of the Convention of St. Petersburg shall remain subject to the provisions of the International Telegraph Regulations, except when it is due to an error of service that such radiotelegrams have been accepted.

When the acknowledgment of receipt of a radiotelegram has not reached the station which transmitted the message, the charge shall not be refunded until it has been proved that the radiotelegram is one which gives occasion for reimbursement.

XI.—ACCOUNTING.

XLII.

Accounts.

1. Coast and ship charges shall not be entered in the accounts provided for by the International Telegraph Regulations.

The accounts relating to these charges shall be settled by the Administrations of the countries concerned. They shall be prepared by the Administrations to which the coast stations belong, and communicated by them to the Administrations concerned. In cases in which the working of the coast stations is independent of the Administration of the country, the person working these stations may be substituted in respect of accounts for the Administration of such country.

2. As to transmission over the lines of the telegraph system the radiotelegram shall be treated in respect of accounts in conformity with the Telegraph Regulations.

3. In the case of radiotelegrams originating from ships the Administration to which the coast station is subject shall debit the Administration to which the ship station of origin is subject with the coast and ordinary telegraph charges, the total charges collected for prepaid replies, the coast and telegraph charges collected for collations, the charges appertaining to express delivery (in the case provided for in Regulation XXXVIII) or delivery by post, and with those collected for supplementary copies (TM). The Administration to which the coast station is subject shall credit, when the case arises, through the channel of the telegraph accounts and through the medium of the offices which have taken part in the transmission of the radiotelegrams, the Administration to which the office of destination is subject with the total charges relating to prepaid replies. With regard to telegraph charges and charges relating to express delivery or delivery by post, and to supplementary copies, the procedure shall be in conformity with the telegraph regulations, the coast station being regarded as the telegraph office of origin.

In the case of radiotelegrams intended for a country lying beyond that to which the coast station belongs, the telegraph charges to be liquidated conformably to the above provisions are those which arise either from tables "A" and "B" appended to the International Telegraph Regulations or from special arrangements concluded between the Administrations of adjoining countries and published by those Administrations and not the charges which might be made under the special provisions of Regulations XXIII (paragraph 1) and XXVII (paragraph 1) of the Telegraph Regulations.

In the case of radiotelegrams and paid-service advices addressed to ships, the Administration to which the office of origin is subject shall be debited directly by that to which the coast station is subject with the coast and ship charges. Nevertheless, the total charges appertaining to prepaid replies shall be credited, if there is occasion, from country to country through the channel of Administration to which the coast station is subject. In respect to the telegraph charges and charges relating to delivery by post and for supplementary copies, the procedure shall be in conformity with the telegraph regulations. The Administration to which the coast station is subject shall credit that to which the ship of destination is subject with the ship charge, if there is occasion, with the charges belonging to the intermediate ship stations, with the total charge collected for prepaid replies, with the ship charge relating to collation, and also with the charges made for preparing supplementary copies and for delivery by post.

The paid service advices, and the prepaid replies themselves, shall be treated, in the radiotelegraphic accounts, in all respects like other radiotelegrams.

In the case of radiotelegrams forwarded by means of one or two intermediate ship stations, each of the latter shall debit the ship station of origin, if the radiotelegram is one coming from a ship, or the ship station of destination if the radiotelegram is one intended for a ship, with the ship charge due to it for transit.

4. In principle the settlement of account appertaining to exchanges between ship stations shall be made directly as between the companies working those stations, the station of origin being debited by the station of destination.

5. The monthly accounts serving as a basis for the special accounting in respect of radiotelegrams shall be drawn up radiotelegram by radiotelegram, with all necessary particulars, and within a period of six months counting from the month to which they belong.

6. The Governments reserve to themselves the option of making between themselves and with private companies (contractors working radiotelegraphic stations, shipping companies, etc.) special arrangements with a view to the adoption of other provisions respecting accounts.

XII.—INTERNATIONAL BUREAU.

XLIII.

Expenses.

The supplementary expenses resulting from the work of the International Bureau in connection with radiotelegraphy must not exceed 80,000 fcs. per annum, not including special expenses to which the meeting of an International Conference gives rise. The Administrations of the contracting States shall be, for the purposes of contribution towards the expenses, divided into six classes as follows:—

1st Class.—Union of South Africa, Germany, United States of America, Alaska, Hawaii, and the other American possessions in Polynesia, the Philippine Islands, Porto Rico and the American possessions in the Antilles, the zone of the Panama Canal, the Argentine Republic, Australia, Austria, Brazil, Canada, France, Great Britain, Hungary, British India, Italy, Japan New Zealand, Russia, Turkey.

2nd Class.—Spain.

3rd Class.—Russian Central Asia (littoral of the Caspian Sea), Belgium, Chili, Chosen, Formosa, Japanese Sakhalin and the leased territory of Kwantung, Dutch Indies, Norway, Holland, Portugal, Roumania, Western Siberia (littoral of the Arctic Ocean), Eastern Siberia (littoral of the Pacific Ocean), Sweden.

4th Class.—Ex-German East Africa, Ex-German South-West Africa, The Cameroons, Togoland, Ex-German Pacific Protectorates, Denmark, Egypt, Indo-China, Mexico, Siam, Uruguay.

5th Class.—French West Africa, Bosnia-Herzegovina, Bulgaria, Greece, Madagascar, Tunis.

6th Class. — French Equatorial Africa, Portuguese West Africa, Portuguese East Africa and the Portuguese possessions in Asia, Bokhara, the Belgian Congo, the Colony of

Curaçao, the Spanish Colony of the Gulf of Guinea, Erythrea, Khiva, Morocco, Monaco, Persia, San Marino, Italian Somaliland.

XLIV.

Work of Berne Bureau.

The various Administrations shall forward to the International Bureau a form modelled on that hereto appended (see page 61) and containing the particulars enumerated in the form with regard to the stations covered by Clause V of the Regulations. Any modifications which may take place and additions shall be communicated by the Administrations to the International Bureau from the 1st to the 10th of each month. With the help of these communications the International Bureau will draw up the Nomenclature provided for by Regulation V. The Nomenclature shall be distributed to the Administrations concerned. It may also, with the supplements relating thereto, be sold to the public at cost price.

The International Bureau shall take care that the adoption of identical call signals for radiotelegraph stations be avoided.

XIII.—METEOROLOGICAL TRANSMISSIONS, TIME SIGNALS, AND OTHER TRANSMISSIONS.

XLV.

Meteorological and other Messages.

1. The Administrations shall take the necessary steps to supply their coast stations with meteorological telegrams containing the particulars of interest to the district of such stations. These telegrams, the text of which must not exceed twenty words, shall be sent to the ships which ask for them. The charge for these meteorological telegrams shall be carried to the account of the ships to which they are addressed.

2. The meteorological observations, made by certain ships appointed for that purpose by the country to which they belong, may be sent once a day as paid service advices to the coast stations authorised to receive them by the Administrations concerned, who shall also appoint the meteorological offices to which these observations shall be addressed by the coast station.

3. Time signals and meteorological telegrams shall be transmitted in succession one to another in such a way that the total duration of their transmission does not exceed ten minutes. In principle, while they are being sent, radiotelegraph stations, transmission by which might disturb the reception of these signals and telegrams, shall keep silent so as to allow all stations which desire to do so to receive these telegrams and signals. Exception shall be made in the case of distress calls and State telegrams.

4. The Administrations shall facilitate the communication to the marine information agencies which they may appoint of the information respecting wrecks and casualties at sea, or presenting a general interest for navigation, which the coast stations can communicate regularly.

XIV.—MISCELLANEOUS PROVISIONS.

XLVI.

Interference.

Transmission exchanged between ship stations must be carried out in such a way as not to interfere with the service of coast stations, as the latter must have, as a general rule, right of priority for public correspondence.

XLVII.

Compulsory Retransmission.

Coast stations and ship stations shall be bound to take part in the retransmission of radiotelegrams in cases in which communication cannot be established directly between the stations of origin and destination.

Nevertheless, the number of transmissions shall be limited to two.

In the case of radiotelegrams intended for *terra firma* use may only be made of retransmissions to reach the nearest coast station.

Retransmission shall be in all cases subject to the condition that the intermediate station which receives the radiotelegram in transit is in a position to send it on.

XLVIII.

Non-Contracting Governments.

If the transmission of a radiotelegram is carried out partly on the telegraph lines or through radiotelegraph stations belonging to a non-contracting Government, such radiotelegram may be sent forward, subject to the reservation that at least the Administrations to which these lines or stations belong shall have declared that they are willing to apply, when the case arises, the provisions of the Convention and of the Regulations, which are indispensable, in order that radiotelegrams may be regularly forwarded, and that accounting may be assured.

Such declaration shall be made to the International Bureau, and brought to the knowledge of the offices of the Telegraph Union.

XLIX.

Operation of Modifications to Regulations.

The modifications of the present Regulations which may be rendered necessary in consequence of the decisions of future Telegraph Conferences shall come into force on the date fixed for the application of the provisions decided upon by each one of these later Conferences.

L.

Application of International Telegraph Regulations.

The provisions of the International Telegraph Regulations shall apply by analogy to radiotelegraph correspondence in so far as they are not contrary to the provisions of the present Regulations.

The following in particular apply to radiotelegraph correspondence :—

The provisions of Article XXVII, paragraphs 3 to 6, of the Telegraph Regulations referring to the collection of charges; those of Articles XXXVI and XLI referring to the indication of the route to be taken; those of Articles LXXV, paragraph 1, LXXVIII, paragraphs 2 to 4, and LXXIX, paragraphs 2

to 4, relating to preparing of accounts. Nevertheless, first, the period of six months provided by paragraph 2 of Article LXXIX of the Telegraph Regulations for the verification of accounts is extended to nine months in the case of radiotelegrams; second, the provisions of Article XVI, paragraph 2, are not considered as authorising the free transmission by radiotelegraph stations of service telegrams relating exclusively to the telegraph service, nor the free transmission over the lines of the telegraph system of service telegrams relating exclusively to the radiotelegraph service; third, the provisions of Article LXXIX, paragraphs 3 and 5, do not apply to radiotelegraph accounting. For the purposes of applying the provisions of the Telegraph Regulations coast stations shall be regarded as offices of transit, except when the Radiotelegraphic Regulations stipulate expressly that these stations are to be considered as offices of origin or destination.

Conformable to Article II of the Convention of London the present regulations will come into force on July 1st, 1913.

In witness whereof the respective Plenipotentiaries have signed these Regulations on a single copy, which will remain deposited in the Archives of the British Government and of which a copy will be sent to each party.

APPENDIX

I.

TABLE REFERRED TO IN REGULATION XLIV (p. 60).

(*a*) Coast Stations.

Name.	Nationality.	Geographical Position. E = East longitude; O = West longitude; N = North latitude; S = South latitude. Territorial subdivisions.	Call Signal.	Normal Range in Nautical Miles.	Radiotelegraph System, with the characteristics of the System of emission.	Wavelengths in Metres (the normal wavelength is underlined).

Nature of Services effected.	Working hours (Time according to the Meridian).	Coast Charge.		*Observations* (if occasion, Time and Method of sending Time-Signals and Meteorological Telegrams).
		Per Word in Francs.	Minimum per Radiotelegram in Francs.	

(*b*) Ship Stations.

Name.	Nationality.	Call Signal.	Normal Range in Nautical Miles.	Radiotelegraph System, with the characteristics of the System of emission.	Wavelengths in Metres.

Nature of Services effected.	Working Hours.	Ship Charge.		*Observations* (If occasion. Name and Address of the person working the Station).
		Per Word in Francs.	Minimum per Radiotelegram in Francs.	

1° Warships.

2° Merchant Ships.

II.

LIST OF ABBREVIATIONS TO BE USED IN RADIOTELEGRAPH TRANSMISSIONS

(referred to in Article XXII, p. 55).

Abbreviation. 1.	Question. 2.	Answer or Advice. 3.
▬ ● ▬ ● ▬▬ ● ▬ (CQ)		Inquiry signal employed by a station which desires to correspond.
▬ ● ▬ ● (TR)		Signal announcing the sending of indications concerning a ship station (Article XXVIII).
▬▬ ● ●▬▬ (!)		Signal indicating that a station is about to send with high power.
PRB	Do you wish to communicate with my station by means of the International Signal Code ?	I wish to communicate with your station by means of International Signal Code.
QRA	What is the name of your station ?	This station is......
QRB	How far are you from my station ?	The distance between our station is...... nautical miles.
QRC	What are your true bearings ?	My true bearings are......degrees.
QRD	Where are you bound ?	I am bound for......
QRF	Where are you coming from ?	I am coming from......
QRG	To what company or line of navigation do you belong ?	I belong to......
QRH	What is your wavelength ?	My wavelength is......metres.
QRJ	How many words have you to transmit ?	I have......words to transmit.
QRK	How are you receiving ?	I am receiving well.
QRL	Are you receiving badly ? Shall I transmit 20 times ● ● ● ▬ ● so that you can adjust your apparatus.	I am receiving badly. Transmit 20 times ● ● ● ▬ ● so that I can adjust apparatus.
QRM	Are you disturbed ?	I am disturbed.
QRN	Are the atmospherics very strong	The atmospherics are very strong.
QRO	Shall I increase my power ?	Increase your power.
QRP	Shall I decrease my power ?	Decrease your power.
QRQ	Shall I transmit faster ?	Transmit faster.
QRS	Shall I transmit more slowly ?	Transmit more slowly.
QRT	Shall I stop transmitting ?	Stop transmitting.
		I have nothing to transmit.
QRU	—	I have nothing for you.
QRV	Are you ready ?	I am ready. All is in order.
QRW	Are you busy ?	I am busy with another station (or with ......please do not interrupt).
QRX	Shall I wait ?	Wait. I will call you at......o'clock (or when I want you).
QRY	What is my turn ?	Your turn is No.....
QRZ	Are my signals weak ?	Your signals are weak.
QSA	Are my signals strong ?	Your signals are strong.
QSB	Is my tone bad ?	The tone is bad.
	Is my spark bad ?	The spark is bad.
QSC	Is the spacing bad ?	The spacing is bad.
QSD	Let us compare watches. My time is ...... What is your time ?	The time is......
QSF	Are the radiotelegrams to be transmitted alternately or in series ?	Transmission will be in alternate order.
QSG	—	Transmission will be in series of five radiotelegrams.
QSH	—	Transmission will be in series of ten radiotelegrams.
QSJ	What is the charge to collect for.... ?	The charge to collect is......
QSK	Is the last radiotelegram cancelled ?	The last radiotelegram is cancelled.
QSL	Have you got the receipt ?	Please give a receipt.
QSM	What is your true course ?	My true course is......degrees.
QSN	Are you communicating with land ?	I am not communicating with land.
QSO	Are you in communication with another station (or with......) ?	I am in communication with ...... (through the medium of......).
QSP	Shall I signal to ...... that you are calling him ?	Inform ...... that I am calling him.
QSQ	Am I being called by...... ?	You are being called by......
QSR	Will you dispatch the radiotelegram ?	I will forward the radiotelegram.
QST	Have you received a general call ?	General call to all stations.
QSU	Please call me when you have finished (or at......o'clock)	I will call you when I have finished.
QSV	Is public correspondence engaged ?	Public correspondence is engaged. Please do not interrupt.
QSW	Must I increase the frequency of my spark ?	Increase the frequency of your spark.
QSX	Must I diminish the frequency of my spark ?	Diminish the frequency of your spark.

Abbreviation. 1.	Question. 2.	Answer or Advice. 3.
QSY	Shall I transmit with a wavelength of ......metres ?	Let us transfer to the wavelength of...... metres.
QSZ	.. ..	Transmit each word twice. I have difficulty in receiving your signals.
QTA	.. ..	Transmit each radiotelegram twice. I have difficulty in receiving your signals or Repeat the radiotelegram you have just sent. Reception doubtful.
QTB	.. ..	Number of words not agreed ; I will repeat first letter of each word and first figure of each group.
QTC	Have you anything to transmit ? ..	I have something to transmit. I have one (or several) radiotelegrams for..

When an abbreviation is followed by a mark of interrogation it applies to the question indicated in respect of that abbreviation.

In addition to these signals, which, it will be observed, are uniform in construction, the following signals of the International Telegraph Code may be used in these communications:—

● ● ▬ ▬ ● ● "Repeat" sign (as well as mark of interrogation).
● ● ● ▬ ● Understood.
● ▬ ● ● ● Wait.

EXAMPLES.

Station		
A	QRA ?	What is the name of your station ?
B	QRA Campania	This is the Campania.
A	QRG ?	To what company or line of navigation do you belong ?
B	QRG Cunard. QRZ	I belong to the Cunard Line. Your signals are weak.

Station A then increases the power of its transmitter and sends :—

A	QRK ?	How are you receiving ?
B	QRK	I am receiving well.
	QRB 80	The distance between our stations is 80 nautical miles.
	QRC 62	My true bearings are 62 degrees, etc.

The following States have subsequently adhered to the Convention but were not represented thereat :—

Bolivia	New Caledonia
Colombia	Newfoundland
Cuba	Norfolk Island
Cyrenaica	Panama
Czecho-Slovakia	Papua
Ecuador	Peru
French Oceania	Sarawak
Guadeloupe	Tonga Islands
Guatemala	Tripoli
Iceland	Venezuela
Martinique	Zanzibar
Mexico	

INTERNATIONAL CONVENTION
ON
SAFETY OF LIFE AT SEA

London, January 20th, 1914.

THE London International Conference on the Safety of Life at Sea, by which the Convention signed on January 20th, 1914, has been drawn up, met for the first time on November 12th, 1913, at the Foreign Office, London. The suggestion that such a Conference should be held emanated from the ex-German Emperor, and the task of convening it was undertaken by the British Government. The following States were represented: Great Britain, Germany, the United States, Australia, Austria-Hungary, Belgium, Canada, Denmark, Spain, France, Italy, Japan, Norway, the Netherlands, Russia, Sweden, and New Zealand. The delegations from the different States, were composed, not of the representatives of the shipping trade, but of administrators, experts and jurists.

The late Lord Mersey was appointed Chairman of the Conference. To deal with the specific subjects submitted to it the Conference appointed five sub-committees, together with a sixth sub-committee for drafting the Convention, which was to embody the recommendations of the Committees as approved by the whole Conference.

The Convention contains seventy-four articles, of which we present below the articles governing the use of wireless telegraphy:—

CHAPTER I.

Safety of Life at Sea.

Article 1.—The High Contracting Parties undertake to give effect to the provisions of this Convention, for the purpose of securing safety of life at sea, to promulgate all regulations and to take all steps which may be necessary to give the Convention full and complete effect.

The provisions of this Convention are completed by Regulations which have the same force and take effect at the same time as the Convention. Every reference to the Convention implies at the same time a reference to the Regulations annexed thereto.

CHAPTER II.

Ships to which this Convention Applies.

Article 2.—Except where otherwise provided by this Convention, the merchant ships of any of the States of the High Contracting Parties, which are mechanically propelled, which carry more than 12 passengers, and which proceed from a port of one of the said States to a port situated outside that State, or conversely, are subject to the provisions of this Convention. Ports situated in the Colonies, Possessions, or Protectorates of the High Contracting Parties are considered to be ports outside the States of the High Contracting Parties.

Persons who are on board by reason of *force majeure* or in consequence of the obligation laid upon the master to carry shipwrecked or other persons, are not deemed to be passengers.

Article 3.—There are excepted from this Convention, save in the cases where the Convention otherwise provides, ships making voyages specified in a schedule to be communicated by each High Contracting Party to the British Government at the time of ratifying the Convention.

No schedule may include voyages in the course of which the ships go more than 200 sea miles from the nearest coast.

Each High Contracting Party has the right subsequently to modify its schedule of voyages in conformity with this Article on condition that it notifies the British Government of such modification.

Each High Contracting Party has the right to claim from another Contracting Party the benefit of the privileges of the Convention for all of its ships which are engaged in any one of the voyages mentioned in its own schedule. For this purpose the Party claiming such benefit shall impose on the said ships the obligations prescribed by the Convention in so far as, having regard to the nature of the voyage, these obligations would not be unnecessary or unreasonable.

Article 4.—No ship, not subject to the provisions of the Convention at the time of its departure, can be subjected to the Convention in the course of its voyage if stress of weather or any other cause of *force majeure* compels it to take refuge in a port of one of the States of the High Contracting Parties.

CHAPTER III.

Safety of Navigation.

Article 5.—When the expression "every ship" is used in this chapter and in the corresponding part of the annexed Regulations it includes all merchant ships, whether they are the ships defined in Article 2 or not, which belong to any of the Contracting States.

Article 6.—The High Contracting Parties undertake to take all steps to ensure the destruction of derelicts in the northern part of the Atlantic Ocean east of a line drawn from Cape Sable to a point situated in latitude 34° north and longitude 70° west. Further, they will establish in the North Atlantic with the least possible delay a service for the study and observation of ice conditions and a service of ice patrol. For this purpose:

Two vessels shall be charged with these three services.

During the whole of the ice season they shall be employed in ice patrol.

During the rest of the year the two vessels shall be employed in the study and observation of ice conditions and in the destruction of derelicts; nevertheless the study and observation of ice conditions shall be effectively maintained, in particular from the beginning of February to the opening of the ice season.

While the two vessels are employed in ice patrol the High Contracting Parties, to the extent of their ability and so far as the exigencies of the Naval Service will permit, will send warships or other vessels to destroy any dangerous derelicts, if this destruction is considered necessary at that time.

Article 7.—The Government of the United States is invited to undertake the management of the three services of derelict destruction, study and observation of ice conditions, and ice patrol. The High Contracting Parties which are specially interested in these services, and whose names are given below, undertake to contribute to the expense of establishing and working the said services in the following proportions:—

	Per cent.
Austria-Hungary	2
Belgium	4
Canada	2
Denmark	2
France	15
Germany	15
Great Britain	30
Italy	4
Netherlands	4
Norway	3
Russia	2
Sweden	2
United States of America	15

Each of the High Contracting Parties has the right to discontinue its contribution to the expense of working these services after September 1st, 1916. Nevertheless, the High Contracting Party which avails itself of this right will continue responsible for the expenses of working up to the 1st September following the date of denunciation of the Convention on this particular point. To take advantage of the said right, it must give notice to the other Contracting Parties at least six months before the said 1st September; so that, to be free from its obligations on September 1st, 1916, it must give notice on March 1st, 1916, at the latest, and similarly for each subsequent year.

In case the United States Government should not accept the proposal made to them, or in case one of the High Contracting Parties, for any reason, should not assume responsibility for the pecuniary contribution defined above, the High Contracting Parties shall settle the question in accordance with their mutual interests.

The Government of the High Contracting Party which undertakes the management of the service of derelict destruction is invited to devise means of granting, at the expense of this service, to merchant ships, which have contributed in an effective manner to the destruction of ocean derelicts, rewards to be fixed by the Government in accordance with the services rendered.

The High Contracting Parties which contribute to the cost of the three above-mentioned services shall have the right by common consent to make from time to time such alterations in the provisions of this Article and of Article 6 as appear desirable.

Article 8.—The master of every ship which meets with dangerous ice or a dangerous derelict is bound to communicate the information by all the means of communication at his disposal to the ships in the vicinity, and also to the competent authorities at the first point of the coast with which he can communicate.

Every Administration which receives intelligence of dangerous ice or a dangerous derelict shall take all steps which it thinks necessary for bringing the information to the knowledge of those concerned and for communicating it to the other Administrations.

The transmission of the messages respecting ice and derelicts is free of cost to the ships concerned.

It is desirable that the said information should be sent in a uniform manner. For this purpose a code, the use of which is optional, appears in Article I of the Regulations annexed hereto.

Article 9.—The master of every ship fitted with a radiotelegraph installation, on becoming aware of the existence of an imminent and serious danger to navigation, shall report it immediately in the manner prescribed by Article II of the Regulations annexed hereto.

Article 10.—When ice is reported on, or near his course, the master of every ship is bound to proceed at night at a moderate speed, or to alter his course so as to go well clear of the danger zone.

Article 11.—The ships defined by Article 2 shall have on board a Morse signalling lamp of sufficient range.

The use of Morse signals is regulated by the Code appearing in Article III, as well as by Article IV of the Regulations annexed hereto.

Article 12.—The use of the international distress signals for any other purpose than that of signals of distress is prohibited on every ship.

The use of private signals which are liable to be confused with the international distress signals is prohibited on every ship.

Article 13.—The selection of the routes across the North Atlantic in both directions is left to the responsibility of the steamship companies. Nevertheless the High Contracting Parties undertake to impose on these companies the obligation to give public notice of the regular routes which they propose their vessels should follow, and of any changes which they make in them.

The High Contracting Parties undertake, further, to use their influence to induce the

owners of all vessels crossing the Atlantic to follow as far as possible the routes adopted by the principal companies.

Article 14.—The High Contracting Parties undertake to use all diligence to obtain from the Governments which are not parties to this Convention their agreement to the revision of the International Regulations for Preventing Collisions at Sea as indicated below:—

(*A*) The Regulations shall be completed or revised in regard to the following points:

(1) The second white light.
(2) The stern light.
(3) A day signal for motor vessels.
(4) A sound signal for a vessel towed.
(5) The prohibition of signals similar to distress signals.

(*B*) Articles 2, 10, 14, 15, 31 of the said Regulations shall be amended in accordance with the following provisions:

Article 2. The second white mast-head light to be compulsory.

Article 10. A permanent fixed stern light to be compulsory.

Article 14. A special day signal to be compulsory for motor vessels.

Article 15. A special sound signal to be established for use by a vessel in tow, or if the tow is composed of several vessels, by the last vessel of the tow.

Article 31. Article 31 to be modified in the following manner: Add to the lists of both day and night signals the international radiotelegraph distress signal.

Article 15.—The Governments of the High Contracting Parties undertake to maintain, or, if it is necessary, to adopt, measures for the purpose of ensuring that from the point of view of safety of life at sea, the ships defined in Article 2 shall be sufficiently and efficiently manned.

Chapter IV, which contains Articles 16 to 30, refers to construction.

CHAPTER V.

RADIOTELEGRAPHY.

Article 31—All merchant ships belonging to any of the Contracting States, whether they are propelled by machinery or by sails, and whether they carry passengers or not, shall, when engaged on the voyages specified in Article 2, be fitted with a radiotelegraph installation if they have on board fifty or more persons in all.

Advantage may not be taken of the provisions of Articles 2 and 3 of this Convention to exempt a ship from the requirements of this chapter.

Article 32.—Ships on which the number of persons on board is exceptionally and temporarily increased up to or beyond fifty as the result of *force majeure*, or because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry shipwrecked or other persons, are exempted from the above obligation.

Moreover, the Governments of each of the Contracting States, if they consider that the route and the conditions of the voyage are such as to render a radiotelegraph installation unreasonable or unnecessary, may exempt from the above requirement the following ships:—

(1) Ships which in the course of their voyage do not go more than 150 sea miles from the nearest coast.

(2) Ships on which the number of persons on board is exceptionally or temporarily increased up to or beyond fifty by the carriage of cargo hands or a part of the voyage, provided that the said ships are not going from one Continent to another, and, that, during that part of their voyage, they remain within the limits of latitude 30° N. and 30° S.

(3) Sailing vessels of primitive build, such as *dhows, junks*, etc., if it is practically impossible to instal a radiotelegraph apparatus.

Article 33.—Ships which, in accordance with Article 31 above, are required to be fitted with a radiotelegraph installation are divided, for the purpose of radiotelegraph service, into three classes, in accordance with the classification established for ship stations in Article XIII (*b*) of the Regulations annexed to the Radiotelegraph Convention, signed in London on July 5th, 1912, viz:—

First Class.—Ships having a continuous service.

There shall be placed in the First Class ships which are intended to carry twenty-five or more passengers:—

(1) if they have an average speed in service of fifteen knots or more;

(2) if they have an average speed in service of more than thirteen knots, but only subject to the twofold condition that they have on board two hundred persons or more (passengers and crew), and that, in the course of their voyage, they go a distance of more than 500 sea miles between any two consecutive ports. Nevertheless these ships may be placed in the Second Class on condition that they have a continuous watch.

Second Class.—Ships having a service of limited duration.

There shall be placed in the Second Class all ships which are intended to carry twenty-five or more passengers, if they are not, for other reasons, placed in the First Class.

Ships placed in the Second Class must, during navigation, maintain a continuous watch for at least seven hours a day, and a watch of ten minutes at the beginning of every other hour.

Third Class.—Ships which have no fixed periods of service.

All ships which are placed neither in the First nor in the Second Class shall be placed in the Third Class.

The owner of a ship placed in the Second or in the Third Class has the right to require that, if the ship complies with all the requirements for a superior class, a statement to the effect that it belongs to that superior class shall be inserted in the Safety Certificate.

Article 34.—Ships which are required by Article 31 above to be fitted with a radiotelegraph installation shall be required, by the Government of the countries to which they belong, to maintain a continuous watch during navigation as soon as the said Governments consider that it will be of service for the purpose of safety of life at sea.

Meanwhile, the High Contracting Parties undertake to require, from the date of the ratification of the present Convention, subject to the delays specified below, a continuous watch on the following ships:—

(1) Ships whose average speed in service exceeds thirteen knots, which have on board 200 persons or more, and which, in the course of their voyage, go a distance of more than 500 sea miles between two

consecutive ports, when these ships are placed in the Second Class.

(2) Ships in the Second Class, for the whole of the time during which they are more than 500 sea miles from the nearest coast.

(3) Other ships specified in Article 31, when they are engaged in the Trans-Atlantic trade, or when they are engaged in other trades if their route takes them more than 1,000 sea miles from the nearest coast.

Ships connected with all kinds of fishing business, including whaling, which are required to be fitted with a radiotelegraph installation, shall not be required to maintain a continuous watch.

The continuous watch may be kept by one or more operators, holding certificates in accordance with Article X of the Regulations annexed to the International Radiotelegraph Convention, 1912, together, if necessary, with one or more certificated watchers. Nevertheless, if an efficient automatic calling apparatus is invented, the continuous watch may be maintained by this means by agreement between the Governments of the High Contracting Parties.

By "certificated watcher" is meant any person holding a certificate issued under the authority of the Administration concerned. To obtain this certificate, the applicant must prove that he is capable of receiving and understanding the radiotelegraph distress signal and the safety signal described in the Regulations annexed hereto.

The High Contracting Parties undertake to take steps to ensure that the certificated watchers observe the secrecy of correspondence.

Article 35.—The radiotelegraph installations required by Article 31 above shall be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 sea miles by day under normal conditions and circumstances.

Every ship which is required, in conformity with the provisions of Article 31 above, to be fitted with a radiotelegraph installation, shall, whatever be the class in which it is placed, be provided in accordance with Article XI of the Regulations annexed to the International Radiotelegraph Convention, 1912, with an emergency installation, every part of which is placed in a position of the greatest possible safety to be determined by the Government of the country to which the ship belongs.

In all cases the emergency installation must be placed, in its entirety, in the upper part of the ship, as high as practically possible.

The emergency installation includes, as provided by Article XI of the Regulations annexed to the International Radiotelegraph Convention, 1912, an independent source of energy capable of being put into operation rapidly and of working for at least six hours with a minimum range of eighty sea miles for ships in the First Class and fifty sea miles for ships in the two other classes.

If the normal installation, which, in accordance with this Article, has a range of at least 100 sea miles, satisfies all the conditions prescribed above, an emergency installation is not required.

The license provided for in Article IX of the Regulations annexed to the International Radiotelegraph Convention, 1912, may not be issued unless the installation complies both with the provisions of that Convention and also with the provisions of this Convention.

Article 36.—The matters governed by the International Radiotelegraph Convention, 1912, and the Regulations annexed thereto, and in particular the radiotelegraph installations on ships, the transmission of messages, and the certificates of the operators, remain and will continue subject to the provisions:

(1) of that Convention and the Regulations annexed thereto, or of any other instruments which may in the future be substituted therefor;

(2) of this Convention, in regard to all the points in which it supplements the aforementioned documents.

Article 37.—Every master of a ship who receives a call for assistance from a vessel in distress is bound to proceed to the assistance of the persons in distress.

Every master of a vessel in distress has the right to requisition from among the ships which answer his call for assistance the ship or ships which he considers best able to render him assistance, but he must exercise this right only after consultation, so far as may be possible, with the masters of those ships. Such ships are then bound to comply immediately with the requisition by proceeding with all speed to the assistance of the persons in distress.

The masters of the ships which are required to render assistance are released from this obligation as soon as the master or masters requisitioned have made known that they will comply with the requisition, or as soon as the master of one of the ships which has reached the scene of the casualty has made known to them that their assistance is no longer necessary.

If the master of a ship is unable, or considers it unreasonable or unnecessary, in the special circumstances of the case, to go to the assistance of the vessel in distress, he must immediately inform the master of the vessel in distress accordingly. Moreover, he must enter in his log book the reasons justifying his action.

The above provisions do not prejudice the International Convention for the unification of certain rules with respect to Assistance and Salvage at Sea, signed at Brussels on September 23rd, 1910, and in particular the obligation to render assistance laid down in Article II of that Convention.

Article 38.—The High Contracting Parties undertake to take all steps necessary for giving effect to the provisions of this chapter with the least possible delay. Nevertheless, they may allow:

A delay not exceeding one year, from the date of the ratification of this Convention for the provision and training of operators and for the installation of the apparatus on ships placed in the First and Second Classes.

A delay not exceeding two years, from the date of the ratification of this Convention, for the provision and training of the operators and watchers on the ships in the Third Class, for the installation of the apparatus on ships in the Third Class and for the establishment of a continuous watch on ships placed in the Second and Third Classes.

Chapter VI refers to Life-saving Appliances and Fire Protection.

REGULATIONS.

SAFETY OF NAVIGATION.

Article 1.

CODE FOR THE TRANSMISSION BY RADIOTELEGRAPHY OF INFORMATION RELATING TO ICE, DERELICTS, AND WEATHER.

Instructions.

Transmission of Information.—The transmission of information concerning ice and derelicts is obligatory. This information may be sent from ship to ship or to the Hydrographic Office, Washington, either in clear or by means of the abbreviations used in Part I of this Code.

The transmission of information relating to weather is optional. Part II of this Code may be used for this purpose, but may be modified at any time by the Meteorological Congress.

Information required:

Part I.—Ice and Derelicts.

1. The kind of ice or derelict observed.
2. The position of ice or derelict when last determined.

Part II.—Meteorological Information.

1. The direction and force of the wind.
2. The set and velocity of the current.
3. Weather or state of the sky at a fixed hour.
4. Height of barometer and air temperature.
5. Barometric tendency and sea-surface temperature.

The time to be adopted:

In all radiotelegrams relating to ice or derelicts the time shall be given in Greenwich mean time.

The Address:

Reports, when sent to the Hydrographic Office, Washington, should be addressed "Hydrographic"; reports to the Meteorological Office, London, should be addressed "Meteorology."

The Message:

1. When sending information about ice or derelicts alone, two groups of five figures each are used, preceded by the word "ice"; these groups may be repeated as often as necessary.

2. If meteorological information is to be sent in addition, a further four groups of five figures each are used, preceded by the word "weather." These groups are inserted at the end of the message after all the information relating to ice has been given.

N.B.—If the message contains the word "weather," all the code groups before that word give information relating to ice, and those after the word "weather" give meteorological information. If there is no word "weather" in the message, it only contains information about ice. (See examples of the two kinds of message given in this Article.)

PART I.

Ice and Derelicts.

Information respecting ice and derelicts is given by means of ten figures divided into two groups of five figures each. These groups are preceded by the word "ice."

Two figures	The day of the month (*dd*), according to Code I.
One figure	The time of observation (*T*), according to Code II.
One figure	The kind of ice observed (*I*), according to Code III.
Three figures	The latitude of the ice observed (*p p p*), to tenths of a degree (see table below).
Three figures.. ..	The longitude of the ice observed (*p′ p′ p′*), to tenths of a degree (see table below).

The first group consists of *ddTIp*.

The second group consists of *ppp′p′p′*.

Codes.

Code I.—*Day of the Month.*

The day of the month is given by two figures, of which the first may be zero: 01 to 31.

Code II.—*Time of Observation.*

The time of observation is included between—	Code No.
1 a.m. and 4 a.m. Greenwich Mean Time ..	1
4 a.m. and 7 a.m.	2
7 a.m. and 10 a.m.	3
10 a.m. and 1 p.m.	4
1 p.m. and 4 p.m.	5
4 p.m. and 7 p.m.	6
7 p.m. and 10 p.m.	7
10 p.m. and 1 a.m.	8

Code III.—*Nature of Ice or Derelict Observed.*

0. No ice observed.
1. Single iceberg. Huge mass of floating ice.
2. Several icebergs.
3. Numerous icebergs.
4. Floeberg. Thick piece of salt-water ice like a small iceberg.
5. Field ice. Ice extending as far as the eye can reach, but through which it is possible to navigate.
6. Pack ice. Pieces of ice broken from berg or floe, partly closed together.
7. Land ice. Ice attached to the shore since the winter.
8. Derelict.
9. (Not allotted.)

Example.

Message sent from Ship to Ship.

—	First Message.	Coded as	Second Message.	Coded as	Third Message.	Coded as	Fourth Message.	Coded as
Date of observation	15	15	15	15	15	15	16	16
Time of observation	10 a.m.–1 p.m.	4	4 p.m.–7 p.m.	6	7 p.m.–10 p.m.	7	4 p.m.–7 a.m.	2
Nature of ice or derelict	Field	5	Numerous icebergs	3	Derelict	8	Single iceberg	1
Position of ice or derelict	Latitude 45° 42′	457	Latitude 46° 5′	461	Latitude 46° 25′	464	Latitude 47° 19′	473
	Longitude 46° 11′	462	Longitude 44° 40′	447	Longitude 43° 58′	440	Longitude 40° 15′	402

The code of the above message would thus be:

S.S. to S.S.

Ice, 15454, 57462: 15634, 61447: 15784, 64440: 16214, 73402.

PART II.

Meteorological Information.

Information respecting weather, etc., is given by four groups of five figures each. These groups are preceded by the word "weather."

First Group (DDPPP);

The day of the month: two figures (*DD*), according to Code I.

The position of the ship when transmitting the message, indicated by three figures (*PPP*), representing the 1° square in which the ship is situated, according to Code IV and the numbered chart annexed to this Article.

Second Group (WWCCX);

Wind direction and force at 8 a.m. at the 75th meridian of west longitude: two figures (*WW*), according to Code V.

Set and velocity of current: two figures (*CC*), according to Code VI.

Weather or state of the sky at the same hour: one figure (*X*), according to Code VII.

Third Group (*BBBAA*) ;

The barometric height to tenths of a millimetre at 8 a.m. at the 75th meridian of west longitude : three figures (*BBB*), according to Code VIII.

Air temperature at the same hour : two figures (*AA*), according to Code IX.

Fourth Group (*bbSSS*) ;

Barometric tendency at 8 a.m. at the 75th meridian of west longitude : two figures (*bb*), according to Code X.

Sea surface temperature at the same hour : three figures (*SSS*), according to Code XI.

CODES.

Code IV.—*Position of Ship*.

A chart gives the numbers to be assigned to each 1° square in the North Atlantic. The position of the ship, when the meteorological data given in Part II were observed, is indicated by the three figures representing the 1° square in which the ship is situated. For example : A position 51° 55′ N., 26° 49′ W. would be reported as 561.

Code V.

Wind Direction (to 16 points) and *Wind Force* at 8 a.m. mean time at the 75th meridian of west longitude (*WW*).

—	Wind Force. Beaufort Scale.	N.N.E.	N.E.	E.N.E.	E.	E.S.E.	S.E.	S.S.E.	S.	S.S.W.	S.W.	W.S.W.	W.	W.N.W.	N.W.	N.N.W.	N.
Calm	0	00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Light breeze ..	1, 2 or 3	01	07	13	19	25	31	37	43	49	55	61	67	73	79	85	91
Moderate breeze	4 or 5	02	08	14	20	26	32	38	44	50	56	62	68	74	80	86	92
Strong wind ..	6 or 7	03	09	15	21	27	33	39	45	51	57	63	69	75	81	87	93
Gale force ..	8 or 9	04	10	16	22	28	34	40	46	52	58	64	70	76	82	88	94
Storm force ..	10 or 11	05	11	17	23	29	35	41	47	53	59	65	71	77	83	89	95
Hurricane ..	12	06	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96

N.B.—The wind direction is to be referred to true bearings.

Code VI.

Direction (to 16 points) and *Velocity of the Current* (*CC*).

Nautical Miles per hour.	N.N.E.	N.E.	E.N.E.	E.	E.S.E.	S.E.	S.S.E.	S.	S.S.W.	S.W.	W.S.W.	W.	W.N.W.	N.W.	N.N.W.	N.
0·25	01	07	13	19	25	31	37	43	49	55	61	67	73	79	85	91
0·5	02	09	14	20	26	32	38	44	50	56	62	68	74	80	86	92
1	03	09	15	21	27	33	39	45	51	57	63	69	75	81	87	93
2	04	10	16	22	28	34	40	46	52	58	64	70	76	82	88	94
3	05	11	17	23	29	35	41	47	53	59	65	71	77	83	89	95
4	06	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
	00	No current.														
	99	No observation.														

N.B.—The current is to be referred to true bearings.

Code VII.

The State of the Sky at 8 *a.m. mean time at the* 75*th meridian* of west longitude :

0. Sky quite clear.
1. Sky quarter clouded.
2. Sky half clouded.
3. Sky three-puaaters clouded.
4. Sky entirely overcast.
5. Rain falling.

6. **Snow or hail falling.**
7. **Haze or mist.**
8. **Fog.**
9. **Thunderstorm.**

Code VIII.—*Height of Barometer.*

The reading of the mercury barometer is to be corrected for index error, and reduced to 0° C. and sea level. A table of corrections is given below.

The corrected reading is coded by omitting the first figure of the barometer reading in tenths of a millimetre: for example, 761.2 mm. is coded 612.

A table for converting hundredths of an inch to tenths of a millimetre is given below.

Code IX.

Air Temperature is coded in two figures according to the following table :—

Degrees Centigrade.	Degrees Fahrenheit.	Code No.	Degrees Centigrade.	Degrees Fahrenheit.	Code No.
−15·0	5·0	00	10·0	50·0	50
−14·5	5·9	01	10·5	50·9	51
−14·0	6·8	02	11·0	51·8	52
−13·5	7·7	03	11·5	52·7	53
−13·0	8·6	04	12·0	53·6	54
−12·5	9·5	05	12·5	54·5	55
−12·0	10·4	06	13·0	55·4	56
−11·5	11·3	07	13·5	56·3	57
−11·0	12·2	08	14·0	57·2	58
−10·5	13·1	09	14·5	58·1	59
−10·0	14·0	10	15·0	59·0	60
− 9·5	14·9	11	15·5	59·9	61
− 9·0	15·8	12	16·0	60·8	62
− 8·5	16·7	13	16·5	61·7	63
− 8·0	17·6	14	17·0	62·6	64
− 7·5	18·5	15	17·5	63·5	65
− 7·0	19·4	16	18·0	64·4	66
− 6·5	20·3	17	18·5	65·3	67
− 6·0	21·2	18	19·0	66·2	68
− 5·5	22·1	19	19·5	67·1	69
− 5·0	23·0	20	20·0	68·0	70
− 4·5	23·9	21	20·5	68·9	71
− 4·0	24·8	22	21·0	69·8	72
− 3·5	25·7	23	21·5	70·7	73
− 3·0	26·6	24	22·0	71·6	74
− 2·5	27·5	25	22·5	72·5	75
− 2·0	28·4	26	23·0	73·4	76
− 1·5	29·3	27	23·5	74·3	77
− 1·0	30·2	28	24·0	75·2	78
− 0·5	31·1	29	24·5	76·1	79
0·0	32·0	30	25·0	77·0	80
0·5	32·9	31	25·5	77·9	81
1·0	33·8	32	26·0	78·8	82
1·5	34·7	33	26·5	79·7	83
2·0	35·6	34	27·0	80·6	84
2·5	36·5	35	27·5	81·5	85
3·0	37·4	36	28·0	82·4	86
3·5	38·3	37	28·5	83·3	87
4·0	39·2	38	29·0	84·2	88
4·5	40·1	39	29·5	85·1	89
5·0	41·0	40	30·0	86·0	90
5·5	41·9	41	30·5	86·9	91
6·0	42·8	42	31·0	87·8	92
6·5	43·7	43	31·5	88·7	93
7·0	44·6	44	32·0	89·6	94
7·5	45·5	45	32·5	90·5	95
8·0	46·4	46	33·0	91·4	96
8·5	47·3	47	33·5	92·3	97
9·0	48·2	48	34·0	93·2	98
9·5	49·1	49	34·5	94·1	99

Code X.—*Barometric Tendency.*

By the "barometric tendency at a given hour" is meant the amount by which the barometric height has changed during the preceding three

hours. It is to be expressed in millimetres. For example, the barometric tendency at 8 a.m. could be obtained by comparing the reading taken at that hour, say 755·7 mm., with a reading taken at 5 a.m., say 759·3 mm. In this case the barometric tendency would be expressed by a fall of 3·6 millimetres. As a general rule the barometric tendency is to be determined from the trace of the barograph.

The barometric tendency is coded in two figures, according to the following table :—

Rise in Barometer.		Code No.	Fall in Barometer.		Code No.
Millimetres.	Inches.		Millimetres.	Inches.	
0·0— 0·4	0·00—0·01	01	0·0— 0·4	0·00—0·01	51
0·5— 0·9	0·02—0·03	02	0·5— 0·9	0·02—0·03	52
1·0— 1·4	0·04—0·05	03	1·0— 1·4	0·04—0·05	53
1·5— 1·9	0·06—0·07	04	1·5— 1·9	0·06—0·07	54
2·0— 2·4	0·08—0·09	05	2·0— 2·4	0·08—0·09	55
2·5— 2·9	0·10—0·11	06	2·5— 2·9	0·10—0·11	56
3·0— 3·4	0·12—0·13	07	3·0— 3·4	0·12—0·13	57
3·5— 3·9	0·14—0·15	08	3·5— 3·9	0·14—0·15	58
4·0— 4·4	0·16—0·17	09	4·0— 4·4	0·16—0·17	59
4·5— 4·9	0·18—0·19	10	4·5— 4·9	0·18—0·19	60
5·0— 5·4	0·20—0·21	11	5·0— 5·4	0·20—0·21	61
5·5— 5·9	0·22—0·23	12	5·5— 5·9	0·22—0·23	62
6·0— 6·4	0·24—0·25	13	6·0— 6·4	0·24—0·25	63
6·5— 6·9	0·26—0·27	14	6·5— 6·9	0·26—0·27	64
7·0— 7·4	0·28—0·29	15	7·0— 7·4	0·28—0·29	65
7·5— 7·9	0·30—0·31	16	7·5— 7·9	0·30—0·31	66
8·0— 8·4	0·32—0·33	17	8·0— 8·4	0·32—0·33	67
8·5— 8·9	0·34—0·35	18	8·5— 8·9	0·34—0·35	68
9·0— 9·4	0·36—0·37	19	9·0— 9·4	0·36—0·37	69
9·5— 9·9	0·38—0·38	20	9·5— 9·9	0·38—0·38	70
10·0—10·4	0·39—0·40	21	10·0—10·4	0·39—0·40	71
10·5—10·9	0·41—0·42	22	10·5—10·9	0·41—0·42	72
11·0—11·4	0·43—0·44	23	11·0—11·4	0·43—0·44	73
11·5—11·9	0·45—0·46	24	11·5—11·9	0·45—0·46	74
12·0—12·4	0·47—0·48	25	12·0—12·4	0·47—0·48	75
12·5—12·9	0·49—0·50	26	12·5—12·9	0·49—0·50	76
13·0—13·4	0·51—0·52	27	13·0—13·4	0·51—0·52	77
13·5—13·9	0·53—0·54	28	13·5—13·9	0·53—0·54	78
14·0—14·4	0·55—0·56	29	14·0—14·4	0·55—0·56	79
14·5—14·9	0·57—0·58	30	14·5—14·9	0·57—0·58	80
15·0—15·4	0·59—0·60	31	15·0—15·4	0·59—0·60	81
15·5—15·9	0·61—0·62	32	15·5—15·9	0·61—0·62	82
16·0—16·4	0·63—0·64	33	16·0—16·4	0·63—0·64	83
16·5—16·9	0·65—0·66	34	16·5—16·9	0·65—0·66	84
17·0—17·4	0·67—0·68	35	17·0 17·4	0·67—0·68	85
17·5—17·9	0·69—0·70	36	17·5—17·9	0·69—0·70	86
18·0—18·4	0·71—0·72	37	18·0—18·4	0·71—0·72	87
18·5—18·9	0·73—0·74	38	18·5—18·9	0·73—0·74	88
19·0—19·4	0·75—0·76	39	19·0—19·4	0·75—0·76	89
19·5—19·9	0·77—0·78	40	19·5—19·9	0·77—0·78	90
20·0—20·4	0·79—0·80	41	20·0—20·4	0·79—0·80	91
20·5—20·9	0·81—0·82	42	20·5—20·9	0·81—0·82	92
21·0—21·4	0·83—0·84	43	21·0—21·4	0·83—0·84	93
21·5—21·9	0·85—0·86	44	21·5—21·9	0·85—0·86	94
22·0—22·4	0·87—0·88	45	22·0—22·4	0·87—0·88	95
22·5—22·9	0·89—0·90	46	22·5—22·9	0·89—0·90	96
23·0—23·4	0·91—0·92	47	23·0—23·4	0·91—0·92	97
23·5—23·9	0·93—0·94	48	23·5—23·9	0·93—0·94	98
24·0—24·4	0·95—0·96	49	The barometric tendency cannot be reported.		99

Code XI.—*Sea Surface Temperature.*

Sea surface temperature to tenths of a degree Centigrade is coded by three figures, or, when necessary, by two figures preceded by zero. If the temperature is negative, the first of these three figures is 5.

For example : — 2·2° C. is coded as 522.
+ 1·0° C. ,, 010.
+15·6° C. ,, 156.

TABLE OF CORRECTIONS FOR REDUCING BAROMETRIC HEIGHTS TO 0° C. AND TO SEA LEVEL.

NOTE.—The barometric reading should first be corrected for index error. This error may be neglected if it is less than 0·3 mm. The + sign indicates that the correction is to be *added* to the barometric ruling. The − sign indicates that the correction is to be *subtracted*.

Height of barometer cistern above sea level. M'tres.	Ft.	In.	− 4° C. 24·8° F.	− 2° C. 28·4° F.	0° C. 32° F.	+ 2° C. 35·6° F.	4° C. 39·2° F.	6° C. 42·8° F.	8° C. 46·4° F.	10° C. 50° F.	12° C. 53·6° F.	14° C. 57·2° F.	16° C. 60·8° F.	18° C. 64·4° F.	20° C. 68° F.	22° C. 71·6° F.	24° C. 75·2° F.	26° C. 78·8° F.	28° C. 82·4° F.
			Corrections to be made.																
			Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.
0	0	0	+0·5	+0·3	0·0	−0·2	−0·5	−0·7	−1·0	−1·2	−1·5	−1·7	−2·0	−2·2	−2·5	−2·7	−3·0	−3·2	−3·5
1	3	3	+0·6	0·4	+0·1	0·1	0·4	0·6	0·9	1·1	1·4	1·6	1·9	2·1	2·4	2·6	2·9	3·1	3·4
2	6	7	+0·8	0·5	0·3	0·0	0·3	0·5	0·7	1·0	1·2	1·5	1·7	2·0	2·2	2·5	2·8	3·0	3·2
3	9	10	+0·9	0·6	0·4	+0·1	0·1	0·4	0·6	0·9	1·1	1·4	1·6	1·9	2·1	2·4	2·6	2·9	3·1
4	13	1	+1·0	0·8	0·5	0·2	0·0	0·3	0·5	0·8	1·0	1·2	1·5	1·7	2·0	2·2	2·5	2·8	3·0
5	16	5	+1·2	0·9	0·7	0·4	+0·1	0·1	0·4	0·6	0·9	1·1	1·4	1·6	1·9	2·1	2·4	2·7	2·9
6	19	8	+1·3	1·0	0·8	0·5	0·2	0·0	0·3	0·5	0·8	1·0	1·3	1·5	1·8	2·0	2·3	2·6	2·8
7	22	0	+1·4	1·2	0·9	0·6	0·3	+0·1	0·1	0·4	0·6	0·9	1·1	1·4	1·6	1·9	2·2	2·4	2·7
8	26	3	+1·5	1·3	1·0	0·7	0·5	0·2	0·0	0·3	0·5	0·8	1·0	1·3	1·5	1·8	2·1	2·3	2·6
9	29	6	+1·7	1·4	1·2	0·8	0·6	0·3	+0·1	0·2	0·4	0·6	0·9	1·1	1·4	1·6	2·0	2·2	2·5
10	32	10	+1·8	1·6	1·3	1·0	0·7	0·5	0·2	0·0	0·3	0·5	0·8	1·0	1·3	1·5	1·9	2·1	2·4
11	36	1	+1·9	1·7	1·4	1·1	0·8	0·6	0·3	·1	0·2	0·4	0·7	0·9	1·2	1·4	1·8	2·0	2·2
12	39	4	+2·0	1·8	1·5	1·2	1·0	0·7	0·5	0·2	0·0	0·3	0·5	0·8	1·1	1·3	1·6	1·9	2·1
13	42	8	+2·2	1·9	1·7	1·3	1·1	0·8	0·6	0·3	+0·1	0·2	0·4	0·7	0·9	1·2	1·5	1·8	2·0
14	45	11	+2·3	2·0	1·8	1·5	1·2	0·9	0·7	0·4	0·2	0·0	0·3	0·6	0·8	1·1	1·4	1·6	1·9
15	49	3	+2·4	2·2	1·9	1·6	1·4	1·1	0·8	0·6	0·3	+0·1	0·2	0·5	0·7	1·0	1·3	1·5	1·8
16	52	6	+2·5	2·3	2·0	1·7	1·5	1·2	0·9	0·7	0·4	0·2	0·1	0·4	0·6	0·9	1·2	1·4	1·6
17	55	9	+2·6	2·4	2·1	1·9	1·6	1·3	1·1	0·8	0·6	0·3	+0·1	0·3	0·5	0·8	1·0	1·3	1·5
18	59	1	+2·8	2·5	2·3	2·0	1·7	1·4	1·2	0·9	0·7	0·4	0·2	0·1	0·4	0·6	0·9	1·2	1·4
19	62	4	+2·9	2·6	2·4	2·1	1·9	1·5	1·3	1·0	0·8	0·6	0·3	0·0	0·3	0·5	0·8	1·0	1·3
20	65	7	+3·0	2·8	2·5	2·3	2·0	1·7	1·4	1·2	0·9	0·7	0·4	+0·1	0·2	0·4	0·7	0·9	1·2
21	68	11	+3·1	2·9	2·6	2·4	2·1	1·8	1·5	1·3	1·0	0·8	0·5	0·2	0·1	0·3	0·6	0·8	1·1
22	72	2	+3·3	3·0	2·8	2·5	2·2	1·9	1·7	1·4	1·2	0·9	0·6	0·3	+0·1	0·2	0·4	0·7	0·9
23	75	6	+3·4	3·1	2·9	2·6	2·4	2·1	1·8	1·5	1·3	1·0	0·8	0·4	0·2	0·1	0·3	0·6	0·8

Table for Converting Barometric Readings in Inches into Millimetres.

Inches and Tenths.	Hundredths of an Inch.									
	0	1	2	3	4	5	6	7	8	9
	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.
27·0	685·8	686·0	686·3	686·6	686·8	687·1	687·3	687·6	687·8	688·1
·1	688·3	688·6	688·8	689·1	689·3	689·6	689·9	690·1	690·4	690·6
·2	690·9	691·1	691·4	691·6	691·9	692·1	692·4	692·7	692·9	693·2
·3	693·4	693·7	693·9	694·2	694·4	694·7	694·9	695·2	695·4	695·7
·4	696·0	696·2	696·5	696·7	697·0	697·2	697·5	697·7	697·9	698·2
·5	698·5	698·7	699·0	699·3	699·5	699·8	700·1	700·3	700·5	700·8
·6	701·0	701·3	701·5	701·8	702·0	702·3	702·6	702·8	703·1	703·3
·7	703·6	703·8	704·1	704·3	704·6	704·8	705·1	705·4	705·6	705·9
·8	706·1	706·4	706·6	706·9	707·1	707·4	707·6	707·9	708·1	708·4
·9	708·7	708·9	709·2	709·4	709·7	709·9	710·2	710·4	710·7	710·9
28·0	711·2	711·4	711·7	712·0	712·2	712·5	712·7	713·0	713·2	713·5
·1	713·7	714·0	714·2	714·5	714·7	715·0	715·3	715·5	715·8	716·0
·2	716·3	716·5	716·8	717·1	717·3	717·5	717·8	718·0	718·3	718·6
·3	718·8	719·1	719·3	719·6	719·8	720·1	720·3	720·6	720·8	721·1
·4	721·4	721·6	721·9	722·1	722·4	722·6	722·9	723·1	723·4	723·6
·5	723·9	724·1	724·4	724·7	724·9	725·2	725·4	725·7	725·9	726·2
·6	726·4	726·7	726·9	727·2	727·4	727·7	728·0	728·2	728·5	728·7
·7	729·0	729·2	729·5	729·7	729·9	730·2	730·5	730·7	731·0	731·3
·8	731·5	731·8	732·0	732·3	732·5	732·8	733·0	733·3	733·5	733·8
·9	734·1	734·3	734·6	734·8	735·1	735·3	735·6	735·8	736·1	736·3
29·0	736·6	736·8	737·1	737·4	737·6	737·9	738·1	738·4	738·6	738·9
·1	739·1	739·4	739·6	739·9	740·1	740·4	740·7	740·9	741·2	741·4
·2	741·7	741·9	742·2	742·4	742·7	742·9	743·2	743·4	743·7	744·0
·3	744·2	744·5	744·7	745·0	745·2	745·5	745·7	745·9	746·2	746·5
·4	746·8	747·0	747·3	747·5	747·7	748·1	748·3	748·5	748·8	749·0
·5	749·3	749·5	749·8	750·1	750·3	750·6	750·8	751·1	751·3	751·6
·6	751·8	752·1	752·3	752·6	752·8	753·1	753·4	753·6	753·9	754·1
·7	754·4	754·6	754·8	755·1	755·4	755·6	755·9	756·1	756·4	756·7
·8	756·9	757·2	757·4	757·7	757·9	758·2	758·4	758·7	758·9	759·2
·9	759·5	759·7	760·0	760·2	760·5	760·7	761·0	761·2	761·5	761·7
30·0	762·0	762·2	762·5	762·8	763·0	763·3	763·5	763·8	764·0	764·3
·1	764·5	764·8	765·0	765·3	765·5	765·8	766·1	766·3	766·6	766·8
·2	767·1	767·3	767·6	767·8	768·1	768·3	768·6	768·8	769·1	769·4
·3	769·6	769·9	770·1	770·4	770·6	770·9	771·1	771·4	771·6	771·9
·4	772·2	772·4	772·7	772·9	773·2	773·4	773·7	773·9	774·2	774·4
·5	774·7	774·9	775·2	775·5	775·7	776·0	776·2	776·5	776·7	777·0
·6	777·2	777·5	777·7	778·0	778·2	778·5	778·8	779·0	779·3	779·5
·7	779·8	780·0	780·3	780·5	780·8	781·0	781·3	781·5	781·8	782·1
·8	782·3	782·6	782·8	783·1	783·3	783·6	783·8	784·1	784·3	784·6
·9	784·9	785·1	785·4	785·6	785·9	786·2	786·4	786·6	786·9	787·1
31·0	787·4	787·6	787·9	788·2	788·4	788·7	788·9	789·2	789·4	789·7
·1	789·9	790·2	790·4	790·7	790·9	791·2	791·5	791·7	792·0	792·2
·2	792·5	772·7	793·0	793·2	793·5	793·7	794·0	794·2	794·5	794·8
·3	795·1	795·3	795·5	795·8	796·0	796·3	796·5	796·8	797·0	797·3
·4	797·6	797·8	798·1	798·3	798·6	798·8	799·1	799·3	799·6	799·8

Table for converting Minutes to tenths of a Degree.

Minutes.	Tenths of a degree.	Minutes.	Tenths of a degree.
0–3	0	34–39	6
4–9	1	40–45	7
10–15	2	46–51	8
16–21	3	52–57	9
22–27	4	58–59	10
28–33	5		

Example.

Message containing Meteorological Information.

Ice :

—	First Message.	Coded as	Second Message.	Coded as
Date of observation	21	21	22	22
Time of observation	1 p.m.—4 p.m.	5	4 a.m.—7 a.m.	2
Nature of ice or derelict	Single iceberg	1	Field ice	5
Position of ice or derelict .. {	Latitude 44° 35′ Longitude 43° 15′	446 432	Latitude 42° 58′ Longitude 47° 3′	430 470

Weather :

—	First Message.	Coded as	Second Message.	Coded as
Date of observation	21	21	22	22
Position of ship .. .. {	Latitude 45° 13′ Longitude 42° 5′	825	Latitude 43° 47′ Longitude 46° 33′	863
Direction and force of wind.. ..	E.S.E. 5	26	S.W. 2	55
Set and velocity of current.. ..	N.W. 2 m-h	82	S.S.E. 1 m-h.	39
Weather	Sky clear	0	Fog	8
Barometer	765·3 mm.	653	753·2 mm.	532
Air temperature	15·3° C.	61	9·8° C.	50
Barometric tendency	Rise ·8	02	Fall 2·7	56
Sea-surface temperature	1·4° C.	014	— ·7° C.	507

The Code of the above message sent to the Meteorological Office would thus be :

Meteorology : Ice 21514, 46432 : 22254, 30470 : Weather 21825, 26820 65361, 02014 : 22863, 55398, 53250, 56507.

Article II.

SAFETY SIGNAL.

The radiotelegraph stations which have to transmit to ships information involving safety of navigation and being of an urgent character (icebergs, derelicts, cyclones, typhoons, sudden changes in the position or form of fixed obstructions or of land marks) shall make use of the following signal, called the safety signal, repeated at short intervals ten times at full power :

— — — (T T T)

In principle, all radiotelegraph stations receiving the safety signal shall, if the transmission of messages by them would interfere with the receipt by any other station of the safety signal and the following safety message, keep silence, in order to allow all interested stations to receive that message. This does not apply to cases of distress.

The safety message shall be transmitted one minute after the safety signal has been sent out, and shall be repeated thereafter three times at intervals of ten minutes.

The Governments of the Contracting States will select the stations which are to send out to mariners safety information of an urgent character.

When the information in question has been sent out by stations performing the time service, it shall be again sent out after the transmission of the time signal and the weather report.

Article III.

MORSE CODE.

INTERNATIONAL SIGNALS.

These signals may be made at night or in thick weather, either by long and short flashes of light, or by long and short sound signals (whistles, fog-horns, etc.), or during the day by hand flags.

1.—URGENT AND IMPORTANT SIGNALS.

You are standing into danger..	· · —
I want assistance: remain by me	· · · —
Have encountered ice	· — —
Your lights are out (*or*, burning badly) ..	· — — ·
The way is off my ship; you may feel your way past me	· — ·
Stop (*or*, heave to); I have something important to communicate	· — · ·
Am disabled; communicate with me ..	· · — ·

2.—GENERAL SIGNALS.

Meaning.	Signal.	Equivalent Letters and How Made.	How Answered.
Preparative ..	· · · · · · · · · &c.	A succession of E's in one group	By the general answer T.
Answer	—	T (singly)	
Spelling	· · — · · · — ·	F F in one group	By the general answer T.
Use International Code of Signals	— — — — — —	M M M in one group	By the general answer T.
International Code Flag sign	— — — —	M M in one group	
Break sign	· · · ·	I I as separate letters	
Stop	· · · · · ·	I I I as separate letters	
Finish of the message	· · · — ·	V E as one group	· — · R. — · · D. As separate letters.
Erase sign	· · · · &c.	A succession of E's as separate letters	By a succession of E's as separate letters.
Annul	W W · — — · — —	W W as one group	By W W as one group.
Repeat word after: (when a single word is required)	I M I · · — — · · W A · — — · — Followed by the word preceding the one required	I M I as one group W A as separate letters	By the general answer T.
Repeat all after: (if more than one word is required)	I M I · · — — · · A A · — · —	I M I as one group A A as separate letters	By the general answer T.
Repeat all: (if the whole message is to be repeated)	I M I · · — — · · A L L · — · — · · · — · ·	I M I as one group A L L as separate letters	By the general answer T.

3.—NATIONALITY SIGNALS.

Meaning.	Signal.	Equivalent Letters and How Made.
American	▬ ● ▬ ● ▬ ● ●	C D as separate letters.
Argentine	▬ ● ▬ ● ▬ ▬ ●	C G ,, ,,
Austro-Hungarian ..	▬ ● ▬ ● ● ● ▬ ●	C F ,, ,,
Belgian	▬ ● ● ▬ ● ▬ ●	D C ,, ,,
Brazilian	▬ ● ● ●	D E ,, ,,
British	● ● ▬ ●	F.
Bulgarian	▬ ● ● ● ● ▬ ●	D F as separate letters.
Chilian	▬ ● ● ▬ ▬ ●	D G ,, ,,
Chinese	● ▬ ● ▬ ●	E C ,, ,,
Colombian	● ▬ ● ●	E D ,, ,,
Danish	● ● ● ▬ ●	E F ,, ,,
Dutch	● ▬ ▬ ●	E G ,, ,,
French	●	E.
German	▬ ▬ ●	G.
Greek	▬ ▬ ▬ ▬ ▬ ● ●	M M in one group followed by D.
Italian	▬ ● ▬ ● ●	C E as separate letters.
Japanese	▬ ● ▬ ●	C.
Mexican	● ● ▬ ● ▬ ● ▬ ●	F C as separate letters.
Norwegian	▬ ▬ ▬ ▬ ▬ ● ▬ ●	M M in one group followed by C.
Peruvian	● ● ▬ ● ▬ ● ●	F D as separate letters.
Portuguese	● ● ▬ ● ●	F E ,, ,,
Russian	▬ ● ●	D.
Siamese	● ● ▬ ● ▬ ▬ ●	F G as separate letters.
Spanish	▬ ▬ ● ▬ ● ▬ ●	G C ,, ,,
Swedish	▬ ▬ ▬ ▬ ●	M M in one group followed by E.
Turkish	▬ ▬ ● ▬ ● ●	G D as separate letters.
Uruguayan	▬ ▬ ● ●	G E ,, ,,
Venezuelan	▬ ▬ ● ● ● ▬ ●	G F ,, ,,

4.—INSTRUCTIONS.

1. THE URGENT AND IMPORTANT SIGNALS may be made without the Preparative Signal being answered if it is supposed that the person addressed cannot reply, or in other special circumstances; but in this case a pause should be made between the Preparative Signal and the message.

2. THE SIGNAL ● ● ▬ ● ● ● ▬ ● (FF) is used previous to any letters which are intended to spell words.

3. THE SIGNAL ▬ ▬ ▬ ▬ ▬ ▬ (MMM) is used previous to any message sent by means of the International Code of Signals.

4. THE SIGNAL ▬ ▬ ▬ ▬ (*MM*) means the Code Flag of the International Code of Signals, and is used as indicated in the Code Book.

5. THE BREAK SIGN is used between the address of the receiver and the text of the message, and after the message if the name of the sender is to be signalled. •

6. THE STOP is used, where necessary, in the text of the signal.

7. THE ERASE is used to cancel the last word or signal group, sent by mistake.

8. THE ANNUL is used to cancel *all* the message.

9. METHOD OF ANSWERING. Each word or signal group, when understood, is to be answered by one long flash ▬ (T).

If a word or signal group is not answered, the sender is to repeat it until answered by a long flash.

At the end of the message, if understood, the receiver will make ● ▬ ● ▬ ● ● (RD).

The Erase and Annul signs are to be answered by their own signs.

10. THE NATIONALITY SIGNAL is made immediately after the answer to the Preparatory Signal has been received, to indicate the nationality of the vessel making the signal. It is answered by the nationality signal of the vessel receiving the message.

SAFETY CERTIFICATE.

Radiotelegraph installation :—

—	Class and numbers required by Articles 33 and 34 of the said Convention.	Actual class and numbers.
Class of Ship :—	—	—
Number of Operators of the 1st Class ..	—	—
Number of ,, ,, 2nd ,, ..	—	—
Number of Certificated Watchers	—	—

III. That in all other respects the ship complies with the requirements of the said Convention so far as those requirements apply thereto.

This certificate is issued under the authority of the Government. It will remain in force until

The undersigned declares that he is duly authorised by the said Government to issue this certificate.

(Signature)

Issued at the day of

WIRELESS LAWS AND REGULATIONS

THE VARIOUS ACTS, DECREES, REGULATIONS, ETC., REFERRED TO IN THE FOLLOWING LAWS ARE ENUMERATED AT THE BEGINNING OF EACH COUNTRY'S LAWS AND DISTINGUISHED BY CAPITAL LETTERS OF THE ALPHABET.

(N.B.—The wireless information in the maps in this book is copyright by the Wireless Press, Ltd., 12-13, Henrietta Street, Strand, London, W.C.2.)

ABYSSINIA

THIS historically famous country, more commonly known to the ancients as Ethiopia, is an empire, at present under the rule of Waizeru Zauditu. The people profess a primitive form of Christianity, but are illiterate.



There are no wireless stations working within the Empire under native administration. There is a station ot Gambeila (8′ 15″ N., 34′ 35″ E.), which is maintained under supervision of the Sudan Government (*for Regulations, see under* "*Sudan*"). There is also a private wireless installation at the Italian Legation in Adis Ababa (9′ 5″ N., 38′ 45″ E.). This station contains a Marconi wireless cabinet apparatus, wavelength for transmission 2,000 metres, for reception up to 15,000 metres. This installation communicates chiefly with Asmara in Eritrea.

ADEN

(See British Somaliland.)

ADMIRALTY ISLAND (MANUS)

(See map on page 146.)

ALASKA

(See United States of America.)

ALGERIA

(See France.)

ANGOLA

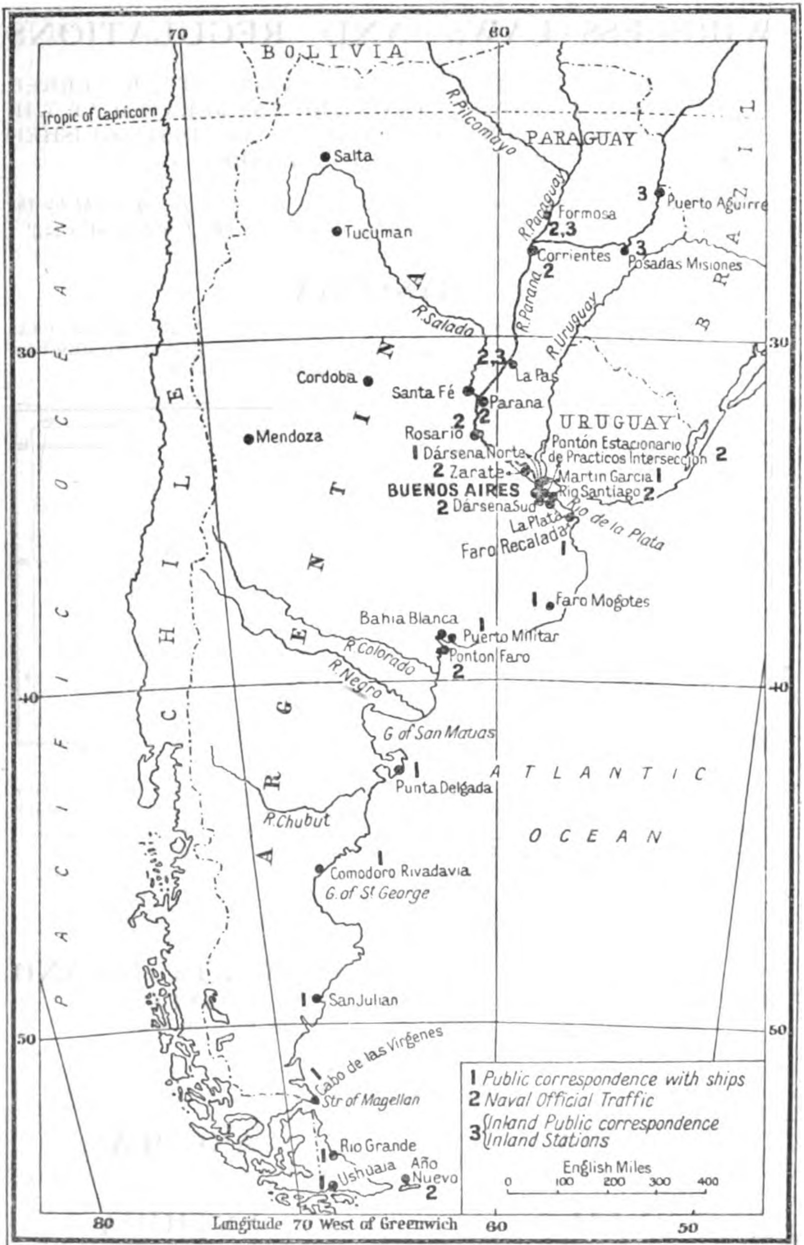
(See Portuguese West Africa.)

ANNAM

(See France.)

ANTIGUA

(See Leeward Islands.)


BOLIVIA
PARAGUAY
Tropic of Capricorn
R. Pilcomayo
Salta
Tucuman
3 Puerto Aguirre
Formosa
2,3
Corrientes
2
3 Posadas Misiones
R. Paraguay
R. Parana
R. Uruguay
R. Salado
BRAZIL
PACIFIC OCEAN
CHILE
ARGENTINA
Cordoba
Santa Fé
2,3 La Paz
Parana
2 2
Rosario
Mendoza
URUGUAY
Pontón Estacionario de Practicos Intersección 2
1 Dársena Norte
2 Zarate
Martin Garcia 1
BUENOS AIRES
Rio Santiago 2
2 Dársena Sud
La Plata
Rio de la Plata
Faro Recalada
1
1 Faro Mogotes
Bahia Blanca
1 Puerto Militar
Ponton Faro
2
R. Colorado
R. Negro
G. of San Matias
1 Punta Delgada
ATLANTIC
OCEAN
R. Chubut
1 Comodoro Rivadavia
G. of St George
1 San Julian
1 Cabo de las Virgenes
Str of Magellan
1 Rio Grande
1 Ushuaia
Año Nuevo 2
1 Public correspondence with ships
2 Naval Official Traffic
3 {Inland Public correspondence / Inland Stations
English Miles
0 100 200 300 400
70 80 60 50 30 40
Longitude 70 West of Greenwich
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ARGENTINA

THE Republic of Argentina is situated in the southern portion of South America between 20° 50′ and 55° 19′ south latitude, and possessing a longitude stretching from 53° 41′ to 70° 56′ west of Greenwich. Argentina is the second in size of the republics of South America. The country was first visited by Spanish explorers in 1516, and remained a colony of Spain until 1810, when the natives commenced their struggle for independence, which was solemnly proclaimed by the Congress assembled at Tucuman in 1816.

This was followed by a long period of civil war until 1853, when a Republican government was constituted and the National Constitution elaborated, with modifications introduced in 1860, 1866, and 1898. Great Britain definitely recognised Argentine independence in 1825. The system of government adopted is that of a Federal Republic composed of three powers—the Executive, the Legislative, and the Judicial. The Executive power is exercised by the President of the Republic, who remains in office for a period of six years, assisted by eight Minister-Secretaries. The Legislative power is exercised by a National Congress composed of two Chambers, the Senate and the Chamber of Deputies.

The total area of the fourteen autonomous provinces and ten national governments which go to make up Argentina comprises in all about 1,132,000 square miles. The capital city is Buenos Aires, situated on the Rio de la Plata. The census of 1914 gave the total population of the country as comprising 7,905,502 persons.

CONTROL.

The Radiotelegraphic Law, passed in October, 1914, definitely assigned the direction ot wireless telegraphy and the public wireless service to the Ministries of Interior and Marine.

The Ministry of Marine has jurisdiction over zones extending as far as 100 kilometres from the sea coast and the Rio de la Plata and 50 kilometres on each bank of the navigable rivers. The rest of the country is under the jurisdiction of the Ministry of War.

The chief of the public maritime radiotelegraph service is the General Secretary of the Ministry of Marine, under the direct control of which is the "División Servicio Radiotelegrafico," which has authority over everything concerning radiotelegraphy within the maritime zone. Under the control of the Ministry of Marine there are 21 coastal radiotelegraph stations, which are of the Telefunken system modified in accordance with the necessities of the Navy. According to the latest information, they are:—

Commercial traffic with ships	16
Naval official traffic only	6
Public correspondence in the inland service ..	17
Official correspondence inland	2

There are also 75 ship stations.

Six new radiotelegraphic stations are being constructed.

The "División Servicio Radiotelegrafico" has its own radiotelegraph works which construct and repair the greater part of the apparatus used in the Navy. These works are also able to effect repairs to radiotelegraph apparatus of merchant vessels calling at Argentine ports.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Dr. Julio Moreno	Minister of Marine	Buenos Aires
Sr. Ricardo Ugarriza ..	Secretary-General of the Ministry and Chief of the Public Maritime Radiotelegraphic Service	Buenos Aires
Lt.-Col. Francisco Arnaut..	Chief of the Divisional Radiotelegraphic Service	Buenos Aires

The Supreme Government has granted four licenses to different companies to instal and work within the country high-power radiotelegraph stations intended for intercontinental radio communication. These companies are: the Compañia Marconi de Telegrafia sin Hilos de la Plata (English), which will place this country in communication with England; the Pan American Wireless Telegraph and Telephone Company (North American), which communicates direct with the United States; Transradio, Argentina, Radiotelegraphic Company, for service with Germany; and the Compagnie Générale de Télégraphie sans Fils, for service with France. These licenses last for a period of thirty years, at the end of which time the goods and installations possessed by the companies will be handed over to the power of the State without any indemnity.

There are also some private stations of very small energy, the installations of which are used solely for experimental purposes.

ORGANISATION.

The Station of Dársena Norte (LIA) transmits daily to all ships and coast stations a news service, as does likewise the radiotelegraph "top" which gives the official time.

There are no special publications devoted to wireless.

ADMINISTRATION.

Below are given the law and regulations in force at the present time :—

A—Law No. 9,127 regarding radiotelegraphy.
B—Regulations made by the Executive Power for Radiotelegraphy.
C—Decrees of the Executive Power amplifying the regulations.

LAW.

A LAW NO. 9,127 PASSED BY THE NATIONAL CONGRESS ON SEPTEMBER 16TH, 1913.

ART. 1.—The wireless service within the national territory, and for international communications within a minimum distance of 1,000 kilometres, shall be exclusively under the control of the State.

ART. 2.—The executive shall attend to the erection of wireless stations within the national territory, and shall so select the sites for the coast ones that all ships sailing near our coasts and navigating our rivers may always be in touch with them.

ART. 3.—The sum of $400,000 national currency are hereby allocated to the above. This amount will be charged to General Expenses.

ART. 4.—The use of wireless apparatus in perfect working order is hereby declared compulsory for all ships calling at the ports of Argentina carrying fifty or more persons on board, counting the passengers and the crew, on and after ninety days have elapsed since the promulgation of this law.

ART. 5.—Wireless apparatus handled by skilled operators must have at all times a transmission power of not less than 200 kilometres for river craft, and not less than 500 kilometres for sea-going vessels.

ART. 6.—No ships will be allowed to leave port until the prescriptions of Arts. 4 and 5 have been complied with, and should the captain or the officer in charge try to elude or contravene this regulation, the superior local marine authority shall impose a fine of from 1,000 to 5,000 pesos. The party so fined can appeal to the federal magistrate of the district where the contravention has been committed. A double fine will be the penalty for a repetition of the offence.

ART. 7.—The Executive will promulgate the regulations in accordance with this law.

ART. 8.—The above Act of Parliament shall be communicated to the Executive.

The above was approved by the Argentine Congress in the city of Buenos Aires on the sixteenth day of September in the year of our Lord nineteen hundred and thirteen.

EXECUTIVE DECREE OF JULY 12TH, 1917.

This is divided into two parts. Of these Part only is printed.

PART I.

CHAPTER I.

SUB-SECTION I.

B ART. 1.—The "General Rules and Regulations for the Radiotelegraphic Service in the Argentine Republic" as issued by the Secretary-General of the Marine Ministry are hereby approved.

ART. 2.—The following Regulations and Ordinances are hereby repealed:

Regulations for the Radiotelegraphic Stations of the Navy (December 1st 1906).

Regulations and Plan of Studies for the Radiotelegraphic Staff (November 27th, 1912).

Regulations for the Radiotelegraphic Service (July 5th 1913).

Regulations for the Radiotelegraphic Service in the Argentine Republic (October 24th, 1914), and every other regulation affecting the Radiotelegraphic Service issued either as General Instructions, Orders of the Day or Circular Letters from the Marine Ministry, as from the year 1906 inclusive to this date.

Art. 3.—The necessary copies of the new Rules, as mentioned in Art. 1) to be printed.

Art. 4.—This decree to be communicated, published, etc.

(Signed) Irigoyen.
F. Alvarez de Toledo.

The following are the documents approved by the Executive Decree above quoted :—

Sub-section 2.

Organisation of the Radiotelegraphic Department.

Art. 1.—The Radiotelegraphic Service constitutes a Department of the General Secretaryship of the Ministry of Marine.

Art. 2.—The following duties correspond to this Department :—

(a) To intervene in everything affecting the military and public radiotelegraphic service depending from the Ministry of Marine and under its inspection and control.

(b) To intervene in the formation of reports and in the claims and suits that may be promoted.

(c) To study and comply with the international laws, regulations, instructions and conventions or pacts that may affect this service.

(d) To work in the reforms tending to improve the service both in connection with technical details and those of a purely disciplinary character.

(e) To intervene in the preparation of instruction plans and the examination of subordinate radiotelegraphists and civil operators, to propose their promotion and to issue the corresponding credentials (*patentes*).

(f) To intervene in the purchase of radiotelegraphic materials, giving advice and reporting on results.

(g) To attend to that part of the correspondence and intercourse with the Berne International Office referring to this service.

Art. 3.—The Radiotelegraphic Service Department will be divided into the following sections :—

(a) Inquiries, Correspondence, and Archives.

(b) Technical Inspection and Superintendency.

(c) Shop, Installations, and Repairs.

(d) Test of apparatus and materials.

(e) Accounting.

Art. 4.—The staffs in the land stations and in the floating lighthouses will be as permanent as consistent with the good service. The staffs will in matters affecting discipline, reexamination and licenses, be subordinate to the Secretary of the Ministry: but the last-named officer will see that the General Direction of Personnel is kept informed of the changes occurring in this service.

With the General Secretary rests the duty of putting before the General Director of Personnel any changes that may be considered necessary in the radiotelegraphic staffs on board units of the Navy.

CHAPTER II.

Regulations Governing the Radiotelegraphic Service.

Sub-section 1.

Jurisdiction of the Several Ministries according to Law No. 9127.

Art. 1.—The national territory is hereby divided into two zones for the purposes of jurisdiction and regularisation affecting the service of radiotelegraphic installations. The aforesaid zones are as follows :—

(a) The *Maritime Zone*, which includes all ship stations in the maritime territorial waters and navigable rivers, besides all land stations situated within one hundred kilometres from the sea and River Plate coasts and those situated within fifty kilometres from the banks of any other navigable rivers.

(b) The *Terrestrial Zone*, which includes all other installations on national territory which are not covered by the above.

Art. 2.—(a) The Maritime Zone is under the jurisdiction of the Minister of Marine, who is responsible for the control of the Public Radiotelegraphic Service and who prescribes the rules and regulations for wireless service in this particular zone.

(b) The Minister of Marine shall also undertake the duty of transmitting all information of any nature which may be asked from him by the International Bureau of Berne.

Art. 3.—(a) The Terrestrial Zone is under the jurisdiction of the Minister of the Interior, who controls the Public Radiotelegraphic Service and who prescribes the rules and regulations for wireless in this particular zone.

(b) In special cases when a state of siege is declared, all installations in this zone shall be placed under the control of the War Office.

Art. 4.—Other Executive Offices can order the installation of wireless stations for their exclusive use, but in such cases the working of such installations must be authorised by the Minister exercising control in the respective zones, and the rules and regulations prescribed for the latter must be observed in these particular stations.

Art 5.—All wireless installations erected in the national territory must observe the international rules and regulations adhered to by the Government of the Republic, and the General Law regulating the Telegraphic Service must be observed in all matters appertaining to the Public Radiotelegraphic Service.

Sub-section 2.

Permits for the Installation of Privately Owned Radiotelegraphic Stations.

Art. 1.—Law 9127 having been passed with the object of nationalising of the wireless service, the installation of high-powered wireless stations by private individuals or corporations shall only be allowed in the national territory when such installations are destined for inter-continental communication.

Art. 2.—The granting of such concessions as authorised by Art. 1 corresponds to the Minister in whose jurisdiction the new station is to be erected.

Art. 3.—Where the Minister having control over the zone where the wireless installation is to be erected has given his consent, all the rulings of said Ministry, or any other of its decisions regarding the stations directly dependent on the said installation, must be obeyed unquestionably.

Art. 4.—In general it shall be the duty of the Minister of the Interior to negotiate the bases of agreements in course of conclusion with neighbouring countries, and he will communicate with the Minister of Marine the results arrived at in the course of such negotiations, so that the latter may give effect to any such conventions in so far as they

affect his department. The Minister of Marine shall have the right of being consulted in the negotiation of the bases for such conventions.

ART. 5.—No radiotelegraphic (transmitting or receiving) station will be erected without obtaining first the necessary license from the Minister in whose jurisdictional zone the station is to be established.

ART. 6.—To obtain the license referred to in Art. 5, the installation must fulfil the following requirements :—

(1) The primary transmitting power must not exceed 50 watts.

(2) The wavelength must not exceed 300 metres in the transmitter.

(3) The receiver may be suitable to receive waves of any length, providing that the Executive Government have no objection thereto.

(4) The installation must not be used for any interchange of messages in the public service. It will be devoted to experimenting, and only when in the judgment of the Government no harm or disturbance would arise from its use to the nearest national stations can the installation send or receive special messages.

ART. 7.—Anyone infringing the rules set out in Arts. 5 and 6 will be penalised in accordance with the penalties established in the General Law relating to the National Telegraph Service.

ART. 8.—Private installations authorised in accordance with Art. 6 must be inspected by the official inspectors, who are entitled to all the information and data they may demand. These installations must be registered and the wireless apparatus must be stamped by an inspector. The Minister exercising jurisdiction in the respective zone can order at any time the closing of authorised private wireless installations.

SUB-SECTION 3.

REGULATIONS AFFECTING ALL INSTALLATIONS ON NATIONAL TERRITORY AND ON BOARD SHIPS.

ART. 1.—The power to be used in all installations on land will be limited to that necessary for communication with the nearest stations in the system. Coast installations which must have high power in order to communicate at long distances are excluded from this limitation.

ART. 2.—(*a*) All installations open to public service must receive all messages sent by stations under the control of any Ministry or by any of the National Telegraph offices, provided that the regulations established by each administration regarding the radiograms which may go over their lines are complied with at the original stations from which the messages are radiated.

(*b*) Foreign vessels under the flag of a country which has not adhered to the London Convention will be allowed to communicate with Argentine coast and stationary ship stations, provided the agents representing the Company owning such foreign ships ask for the extension of this privilege and fulfil all the requirements established by the present Regulations and by the London Radiotelegraphic Convention.

ART. 3.—Radiograms will be transmitted in the order of priority established by the Law on National Telegraphs and the Radiotelegraphic Convention, namely :—

(*a*) Distress calls have absolute priority upon any other communication; then follow :—

(*b*) Service notices of whatever origin when referring to "the Safety of Life at Sea" or containing information of an urgent character for navigation.

(*c*) Messages from the Executive Government.

(*d*) Service notices from the Radiotelegraphic stations.

(*e*) Messages from the Ministry of Marine, its dependencies and its fleets.

(*f*) Service notices from the shipping companies.

(*g*) Private messages.

ART. 4.—In accordance with Art. 101 of the Law on National Telegraphs, messages belonging to the same category will be transmitted by the station of origin in the order in which they are delivered to this station, and by the relay stations, in the order in which they are received.

ART. 5.—In accordance with Art. 102 of the Law on National Telegraphs, private messages stamped as urgent in the "telegraph" system, should have priority in transmission, even upon messages of a superior category not stamped as urgent.

ART. 6.—Any radiogram referring to the internal service of a fleet, squadron or division in march, will be considered as urgent and transmitted accordingly.

ART. 7.—Every official unprepaid radiogram or telegram sent by Marine officers with authority to do it, will be signed with the corresponding telegraphic address, and such messages will be legalised outside their text with the seal and signature of the competent officer on land or on board.

ART. 8.—The following is a list of Marine Officers who are authorised to send unprepaid radiograms and telegrams, according to the Navy Disciplinary Regulations :—

Secretary-General of the Ministry.

Chief of the Radiotelegraphic Department.

Chief of the Hydrography, Lighthouses and Buoys Department.

Inspector of the Marine Ministry's Dependencies in Tierra del Fuego and Cabo Virgenes.

Director-General of Personnel.

Director-General of Material.

Director-General of Administration.

Prefect-General of Ports.

Prefects of Maritime and River Zones.

Director of the Naval School.

Director of the Training School.

Director of the Mechanics School.

Chiefs of Fleets, Divisions, Squadrons, Light Squadrons or Groups.

Chiefs of Staff of Squadrons and Divisions.

Chiefs of Shipyards and Maritime Zones.

Chief of the Aviation Grounds in "Fuente Barragán."

Commanders of Ships.

Commander of the Marine Depot (*Depósito de Marinería*).

Command of Coast Artillery and "Martin García."

Managers of Coast Radiotelegraphic Stations.

Managers of Lighthouses and Director of the "Año Nuevo" Observatory, when addressing the Chief of Hydrography, Lighthouses and Buoys, or the sectional chiefs in his jurisdiction.

Sub-Prefects and their Assistants when

addressing the Prefect-General or the jurisdictional Prefect.

The lists of officers belonging to other branches of national service and who have authority to forward unprepaid messages will be communicated to the Radiotelegraphic Offices when necessary.

Art. 9.—The Manager of a station may demand from any sender of a radiogram proof of his identity before transmitting the message, acting in accordance with Arts. 82 and 83 of the Law on National Telegraphs of 1875.

Art. 10.—In order to improve the service and with a view to regulate the exchange of radiograms between units of the Navy, coast stations, and foreign ships—strictly following the regulations established by the London International Radiotelegraphic Convention of 1912—the Radiotelegraphic Stations belonging to the Navy—whether opened or not to the public—will act in the way hereinafter detailed to make their calls, answers, transmissions, requests of rectification, repeats and notices of reception—viz. :—

1. *Calls.*

Every call is made up by the sign — • — • — followed by the letters of the station to be called, repeated three times, and by the word " de " (— • •), followed by the call letters of the calling station repeated three times.

Example of a Call.—Station LIA calls station LIC thus: — • — • — LIC LIC LIC — • • LIA LIA LIA.

2. *Answers.*

The station that is being called answers thus: The sign — • — • — followed by the call letters of the calling station, repeated three times: then the word " de " followed once by the call letters of the called or answering station, and ending with the sign — • — (invitation to transmit).

Example of an Answer.—Station LIC answers its call to station LIA inviting the latter to transmit its communication, thus: — • — • — LIA LIA LIA — • • LIC — • —

3. *How to Transmit a Radiogram.*

The following are the elements in which is divided every radiogram:

1. Sign of attention — • — • —
2. Preamble.
3. Supplementary Service instructions, if any.
4. Address.
5. Text of the radiogram.
6. Signature.
7. Signal of end of message • — • — •
8. Call letters of the transmitting station.

If there are several radiograms to transmit these letters will be sent only after the last message.

The *Preamble* of a radiogram is composed as follows:—

I. The word " Radio."
II. Class of the radiogram.
III. Category of the radiogram. (Class and category are expressed by a group of letters called *prefix*.)
IV. Name of the office of origin.
V. Number of the radiogram.
VI. Number of words.
VII. Date and hour in which the radiogram was received for transmission.
VIII. Service instructions.
IX. Sign — • • • — (Double hyphen).

Supplementary service instructions are those which are transmitted upon request from the sender, and are charged for.

The following order will be observed in the transmission of every radiogram:

Preamble:

1. Sign of attention — • — • —
2. The word " *Radio.*"
3. Class of the radiogram.
4. Category of the radiogram.
5. Name of office of origin.
6. Number of the radiogram
7. Number of words.
8. Date and hour in which the radiogram was received for transmission.
9. Service instructions.
10. The sign — • • • —

Supplementary Service Instructions:

11. Supplementary service instructions (if any).
12. The sign — • • • —

Address:

13. The address (which will have at least two words).
14. The sign — • • • —

Text:

15. The test of the radiogram.
16. The sign — • • • —

Signature:

17. Signature.
18. Signal of end of message • — • — •
19. Call letters of the transmitting station.

Examples.—1. At 8.15 a.m. of the 15th of a month was delivered at the *TORO* station a radiogram for transmission, as follows: Lopez Sarmiento 667 Buenosaires. Send by fast freight 10 cases Viscosine oil. Suárez.

The above radiogram will be transmitted in the following order: — • — • — Radio (prefix of class and category) *TORO.* 175 13 15 8.15 m. — • • • — López Sarmiento 667. Buenosaires — • • • — Send by fast freight 10 cases Viscosine oil — • • • — Suárez • — • — • LMP.

2. The Radiotelegraphic installation of " Dársena Norte " receives the following message on the 25th at 8.15 p.m. from *Morón* for *Benitez*, steamship *Rawson: On arrival you will find letter and documents asked for. Rodriguez.*" This radiogram will be transmitted thus: — • — • — Radio (prefix) Morón 16 14 25 8.15s. — • • • — Benitez Steamship Rawson — • • • — On arrival you will find letter and documents asked for — • • • — Rodríguez • — • — • LIA.

3. Example of a radiogram from the ship *Cabo Corrientes*, on the 15th at 3 p.m., to be transmitted to Berlin, via Monrovia, and reading: Schroeder Uhlandstrasse 35 Berlin. Send motor type DRS 10 HP. Wagner. This message will be transmitted thus: — • — • — Radio (prefix) Cabo Corrientes 25 11 15 3 s via Monrovia — • • • — Schroeder Uhlandstrasse 35 Berlin — • • • — Send motor type DRS 10 HP. — • • • — Wagner • — • — • LMO.

4. *Notice of Reception.*

When the receiving station receives a radiogram and has verified the number of words stated in the preamble, notice of reception must be given in this form:

" Call letters of the transmitting station followed by the word *de* (from) followed by its own call letters. Then the letter *R*, the number of the radiogram and the sign to indicate end of transmission • — • — • or end of work • • • — • —, as the case may be.

Example: — • — • — LIA de LMX R 76 • — • — •

5. *How to ask for a "Repeat."*

The method to ask for a repeat will be the following :—

"The characteristics of the transmitting station will be sent followed by the word *de* (from), and then by the characteristics of the receiving station, and the combination QTA followed by the number of the radio."

Example : ▬ ● ▬ ● ▬ LIA de LMX QTA 77 ▬ ● ▬

If only a part of the radiogram is to be repeated, the message will be : ▬ ● ▬ ● ▬ LIA de LMX QTA 78 desde (from) ...... ▬ ● ▬

Should the receiving station have any doubt as to the radiogram received or the number of its words, a rectification may be requested thus :—

"Sign of attention ▬ ● ▬ ● ▬; call letters of the transmitting station, once; the word *de* (from) : call letters of the receiving station; the combination QTC : the number of the radiogram to be rectified and the signal ▬ ● ▬

Example : LMX asks from LIA the rectification of radiogram 71 : ▬ ● ▬ ● ▬ LIA ▬ ● ● ● LMX QTC 71 ▬ ● ▬

Station LIA answers : ▬ ● ▬ ● ▬ LMX ▬ ● ● ● LIA QTC 71 r z p 2 v w k r ● ▬ ● ▬ ●

Here the letters and figures r, z, p, 2, v, w, k, r are the initial letters of each word and the first figures of each number.

6. *How to Express the Number of Words.*

When the actual number of words signalled is not the same as the number of words charged for, the fact should be expressed as a common fraction in which the numerator will indicate the number of words charged for and the denominator the actual number of words transmitted.

Take as an example the following radiogram : Alvarez Calle Corrientes 725 Buenosaires. Ship immediately; 100 litres benzine, 5 kilograms oakum, 5 kilograms Viscosine oil Suárez 22/18 (22 ▬ ● ● ▬ ● 18).

The real number of words in the message is 18, but the three punctuation marks and the *underline* are counted and charged as words.

7. *How to give the Date and Hour.*

The date and the hour will be indicated by two groups of figures : the first group will represent the date of the month, and the second the hour and minutes followed by the letter *m* or the letter *s*, as the case may be, meaning *before noon* and *after noon*, respectively.

For instance, in a message received for transmission the 15th of the current month at 4.36 p.m., this information will be given thus : 15 4.36 *s*.

8. *How to Use the Sign* ▬ ● ● ● ▬

Hereafter the sign ▬ ● ● ● ▬ will be used to represent the double dash (=), and not as heretofore to represent the letter *elle* (*ll*). This letter *ll* will be represented from now on by two consecutive *elles* (*l*) (● ▬ ● ● ● ▬ ● ●).

9. *How to Request a Station to Wait.*

When a coast station is not ready to receive a number of radiograms after the preliminary communications from a ship, as detailed in Art. XVIII of the Rules annexed to the London Radiotelegraphic Convention of 1912, the land station will have to instruct the ship to wait, and such instructions will be communicated in the following manner : ▬ ● ▬ ● ▬ LMO ▬ ● ● ● LIA ● ▬ ● ▬ ● ▬ ● 50 ● ▬ ● ● ● 10 ● ▬ ● ▬ ●

This means that the station LIA acknowledges receipt of communication from station LMO, and using the service TR notation informs LMO that it has 50 words to communicate, and begs the ship station to wait ten minutes. In these communications the figures will be transmitted using the abridged notation.

10. *Use of TR Notation.*

Service communications will be preceded by the *TR* notation.

ART. 11.*—When the text of a radiogram is totally or partially in plain language, the following information will be given in the radiogram :—

1. Total number of compound words as a basis for the charge.
2. Number of plain words in plain language or with a conventional meaning.
3. Number of groups of figures or letters, expressed thus :

20/12/6.

This rule applies specially :—

(*a*) When a radiogram in plain language contains words of more than 15 letters (international system of counting words) or more than 7 syllables (according to our national rule).

(*b*) When a radiogram in code language contains words with more than 10 letters.

(*c*) When the radiogram contains groups of figures or letters of more than five characters.

ART. 12.—A radiogram must not contain more than 100 words. If the sender needs more words he must divide his communication in as many messages as necessary to comply with the above rule, and these radiograms will be transmitted alternatively with those from other senders presented for the next turn.

Official unprepaid radiograms must not contain more than 50 words.

ART. 13.—(*a*) Radiotelegraphic messages transmitted, relayed or received will be kept in the utmost secrecy, as well as the note books, traffic sheets, reports and liquidations of accounts. It is forbidden to divulge the contents of communications intercepted during service hours, even if they do not affect the national public service or the naval service.

(*b*) If an intercepted radiotelegram contains damaging statements affecting national interests in land or at sea, the information must be communicated at once to the superior of the operator picking up the message, and this operator must keep a memorandum of the text and address of the radiogram concerned.

ART. 14.—It is the duty of every radiotelegraphist to communicate without delay to his superior the contents of intercepted radiograms containing excitations to revolt or affecting the safety of the nation. This information must be transmitted by the superior officer to a competent authority.

ART. 15.—Radiotelegraphic communications, like ordinary telegrams, are confidential ; therefore, persons not belonging to the staffs shall not be admitted into the stations.

ART. 16.—In cases referring to the Radiotelegraphic service, not covered by these regulations, the international radiotelegraphic

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* This article and the article following would appear to be intended to apply rather to purely Argentine working, as they seem inconsistent with the provisions of the International Telegraph and Radiotelegraph regulations.

conventions and the Law on National Telegraphs will apply. But if a rule or regulation is not found, the case must be submitted in consultation to the nearest (superior) office or to the Radiotelegraphic Department.

To ensure a good service, it is the duty of coast stations to give to ship stations all the information they may require.

ART. 17.—Radiograms will be delivered following the rules contained in Art. 32 of the Law on National Telegraphs.

SUB-SECTION 4.

CHIEF OF THE PUBLIC MARITIME RADIOTELEGRAPHIC SERVICE.

ART. 1.—The Secretary-General of the Ministry of Marine shall have under his control the Public Radiotelegraphic Maritime Service and his duties will be as follows:—

(*a*) He shall supervise all coast stations and ship stations after installation, both of national and foreign register, calling at national ports, and shall also supervise all coast stations, as prescribed in Article 2 of Law 9127.

(*b*) He shall control the service of the said stations and will draft the regulations for same, taking care that the rules herein established and the international Conventions accepted by the National Government are duly fulfilled.

(*c*) He shall see to it that all regulations concerning rates, discounts and reimbursements, as well as any others that may be later on prescribed by the Post and Telegraph Office regarding the requirements of radiograms relayed to the National Telegraph lines are faithfully complied with.

(*d*) He shall forward to the Office of Posts and Telegraphs all claims made to the Prefect-General of Ports by Steamship Companies, ship captains or passengers referring to rates, discounts and reimbursements.

(*e*) He shall issue through the Office of the Prefect-General of Ports the permits for the erection of wireless on board those ships which may have obtained leave to do so in accordance with these Regulations.

(*f*) He shall issue licenses to the wireless telegraphists operating at all stations working within the Maritime Zone, so soon as the conditions affecting such licenses have been fulfilled in accordance with these Regulations.

(*g*) He shall cancel such licenses and permits granted to stations and operators within the Maritime Zone as it may, for a good reason, be found necessary to withdraw.

(*h*) He shall enforce, through the Office of the Prefect-General of Ports, the payment of all fines imposed on shipping companies or ships, and shall direct the deposit of the said fines in the National Bank to the order of the Director of Posts and Telegraphs.

(*i*) He shall have it in his power to authorise the installation of wireless by private individuals or corporations within the Maritime Zone in accordance with Chapter II, Sub-section 1, Art. 5.

ART. 2.—The head of the Public Maritime Radiotelegraphic Service shall act jointly with the Director of Posts and Telegraphs in the following matters:—

(*a*) In all matters referring to wireless stations installed on the Maritime Zone.

(*b*) In all matters referring to rates, discounts and reimbursements of the Public Radiotelegraphic Maritime Service in order to obtain a monthly settlement of accounts by the shipping companies or ship captains with the Office of Posts and Telegraphs in conformity with the schedules prepared by the latter.

(*c*) In the investigation of any questions that may arise for consultation from the Wireless International Service. In all such cases, the Office of Posts and Telegraphs shall communicate with the foreign administrations and authorities concerned.

ART. 3.—The Director of Posts and Telegraphs shall deal directly with the Secretary-General of the Ministry of Marine in all cases relating to the Maritime Radiotelegraphic Service.

ART. 4.—The necessary instructions to give effect to the provisions of Art. 1, paragraph (*c*), and all other regulations concerning the internal management of the radiotelegraphic stations in this jurisdiction, will be issued through the Department of Radiotelegraphic Service. These instructions shall be communicated to the stations by means of private circulars.

SUB-SECTION 5.

THE GENERAL OFFICE OF THE PREFECT-GENERAL OF PORTS.

ART. 1.—The duties of the Prefect-General of Ports will be as follows:—

(*a*) He shall give effect to the provisions made in Articles 4, 5 and 6 of Law 9127 and shall direct the deposit at the Bank of the "Nación Argentina" of the fines imposed for the non-fulfilment of said provisions. The money so deposited must be placed to the order of the Director of Posts and Telegraphs.

(*b*) He shall receive from shipping companies, captains or passengers all complaints regarding unsatisfactory service in the coast and ship stations, and shall forward them to the head of the Maritime Radiotelegraphic Service.

(*c*) Should any complaints be made upon the arrival in port of any vessel, the Prefect shall collate the evidence and forward it to the head of the Naval Radiotelegraphic Service, and he shall act in the same manner should the complaints be made in writing.

(*d*) He shall prevent the departure of any ship which may have failed to make the necessary deposit at the National Bank (to the order of the Director of Posts and Telegraphs) of the fines imposed in accordance with Article 6 of Law 9127.

(*e*) Both upon the arrival and departure of merchant ships the Prefect shall have the wireless installations inspected in order to ascertain whether they are in perfect working order and whether the power of the apparatus is that fixed by Law 9127.

ART. 2.—The General Office of the Prefect-General of Ports will refer all matters concerning ship stations to the Director of the Public Maritime Radiotelegraphic Service.

ART. 3.—Besides the inspection and control of ship stations in territorial waters and on craft of all register the general office of the Prefect-General of Ports must attend to the following:—

(1) The dismantling of the transmitting apparatus of the wireless installation as soon as the ship has moored or anchored.

This precaution could be dispensed with, with the consent of the Maritime authority, in the ports of the Southern Coast and in

river ports, where no radiotelegraphic land stations are in existence.

(2) He shall ascertain whether the wireless operator or operators have licenses corresponding to the installation they are working, in conformity with Article X of the Service Regulations annexed to the London Convention.

(3) In such cases as those covered by Article XII of the Service Regulations above mentioned, the Prefect-General of Ports shall act jointly with the Director-General of Supplies of the Ministry of Marine in order to give effect to the provisions of the said Article.

ART. 4.—First contraventions of the provisions of Art. 5, paragraph 1, will be recorded by the General Office of the Prefect-General of Ports, and each of those following the first will cause a fine of one hundred pesos, national currency.

SUB-SECTION 6.

COAST STATIONS.

Under the Control of the Head of the Public Maritime Radiotelegraph Service and Open to Public Service.

ART. 1.—The internal service of these stations will be subject to the provisions of these Regulations and those that may be brought into force subsequently.

ART. 2.—Coast stations not open to public service may or may not be shown in the Official Nomenclature as deemed expedient by the Ministry of Marine.

ART. 3.—Radiotelegrams must be deposited by the public at telegraph offices, but radiotelegraphic coast stations subject to the Ministry of Marine will receive direct, and within the regulation hours telegrams presented by the public at such stations when there does not exist a telegraph office in the locality or in the event of such telegraph office being without communication with the remainder of the system.

Exception from this provision is made for private radiotelegrams from the personnel of the Navy and addressed to stations of the Ministry of Marine, and such radiotelegrams, whether or not there is a telegraph office at the place of origin, may be despatched on prepayment of the relative tariff from any radiotelegraph coast station under the control of the said Ministry.

The radiotelegrams referred to in the first paragraph shall follow this route, namely :—

(*a*) Messages originating from a telegraph office shall continue transmission by the telegraph route as far as the place where is situated the radiotelegraph coast station that is to transmit them to a ship or to the coast station which is nearest that of destination.

(*b*) Messages handed in by the public at coast stations shall be transmitted by wireless route to the nearest telegraph office having expeditious communication, and thence by the telegraph system to the point of destination or to the other coast station that is to transmit them to the ship station.

(*c*) Radiotelegrams to ship stations that are within the range of the coast stations from which they originate will be interchanged direct.

With regard to radiotelegrams deposited by the public at coast stations, and destined for a place in the interior of the country or abroad, and those messages which, owing to interruption of the telegraph line with the point of destination, are handed in at a telegraph office for transmission by wireless route, will be accepted only conditionally.

ART. 4.—Coast stations will accept and retransmit traffic handed over to them by the National Telegraphs, when such traffic cannot reach its destination in due course, by reason of interruption or congestion of its lines. Either of these two circumstances will be communicated directly by the Chiefs of the District to the Officers in Charge of the stations, who will also be advised of the extent of the interrupted sector, or in case of congestion, the number of messages to be retransmitted by the wireless route in order to normalise the traffic. In case of lack of communication between the telegraph office and its head office, the Chief of the former will directly request the cooperation of the interchange radiotelegraph station, making known this circumstance.

In case of interruption or congestion of the lines south of Bahia Blanca, messages from and for Punta Arenas will be retransmitted by stations of the radiotelegraph system only in the event of their destination or origin being any of the offices comprised between Bahia Blanca and Ushuaia.

ART. 5.—If, although there exists at the place where the message is handed in a National Telegraph Office, having efficient communication, or when the message could be retransmitted to destination by the telegraph lines, the sender should, nevertheless, prefer the radiotelegraph route, over the greater part of its transmission, the message will be charged double the ordinary tariff collected by the Natioanl Telegraphs in respect of inland telegrams, without prejudice to other taxes that may be applied, calculated according to general rules.

ART. 6.—The men of the Navy shall be able to make use of the wireless system over the greater part of the route from any radiotelegraph station under the control of the Minister of Marine on payment of double the ordinary tariff as mentioned in the previous Article.

Crews and passengers of mercantile vessels of Argentine registry will enjoy the same privilege on payment of the double coast tax.

ART. 7.—Coast stations will not accept from the public messages in secret language unless they have been previously viséd by the Chief of the Telegraph Office of the place.

ART. 8.—Messages for the "Press, Stock Exchange and Commercial Centres," will not enjoy the half-rate concession that applies to transmission over the national telegraph lines, if the sender should prefer the radiotelegraph route.

ART. 9.—Public messages received by radiotelegraph stations will be delivered, without exception, to the nearest Post Office for distribution.

ART. 10.—The prefix "D P X" will be employed for those public messages whose senders have paid the double tariff or coast charges indicated in Articles 5 and 6. Such messages will have priority of transmission by the wireless route over other public messages.

ART. 11.—The hours which will be in force at coast stations, as regards attention to the public, will be from 8 a.m. to 8 p.m., both in winter and summer.

ART. 12.—For the supervision of the radiotelegraph service and control of the fulfilment of everything specified in the International Radiotelegraph Convention of London, and of the present regulations, on the part of all radiotelegraph stations, whether ship stations or

coast stations in the maritime zone, the undermentioned are designated as stations of control:

Dársena Norte will control the port of Buenos Aires and the vicinity.

La Paz will control the port of Rosario and the vicinity.

Rio Santiago will control the port of La Plata and the vicinity.

Puerto Militar will control its own port and Bahia Blanca and the vicinity.

Cabo Virgenes will control the south coast.

ART. 13.—In the territories of Santa Cruz and Tierra del Fuego the control over the radiotelegraph service will be exercised by an inspector appointed by the Ministry of Marine.

ART. 14.—For the purpose of accounts, the coast station will be considered as the terminal station in respect of radiotelegrams emanating from the national radiotelegraph service for ship stations, and shall be considered as stations of origin for those messages emanating from ships.

ART. 15.—Coast stations shall accept with absolute priority distress messages made by ships and shall transmit them as "Urgent" messages over the land system.

ART. 16.—Coast stations shall not despatch any official radiotelegram by the lines of the National Telegraphs emanating from vessels or departments of the Ministry of Marine which can reach its destination without such requisite.

Exception is made as regards official urgent radios which may be delayed by interruptions in the radiotelegraph transmission due to atmospheric perturbations or other causes. Nevertheless, according as services may allow they will be transmitted by the wireless route.

ART. 17.—When a vessel of the National Navy shall transmit the "Interruption" signal —• • —• • —• • — repeated several times and followed by her call signal, national merchant vessels and coast stations shall suspend all communication immediately, excepting in cases of shipwreck.

This signal of interruption, which is designated as "Naval Service," shall only be used on the order of the commander of the vessel and shall be employed only in urgent cases that do not permit the normal service wait.

ART. 18.—Apart from cases of shipwreck, the station of Dársena Norte has precedence over the others. When that station transmits the interruption signal, all land stations and ships shall suspend their communications to enable the station of Dársena Norte to work without interruption.

ART. 19.—The radiotelegraph coast stations of the State performing the service of the National Telegraphs shall also observe an internal time table between themselves for the interchange of radios of the public service.

ART. 20.—All national ship and land stations shall suspend their communications during the time that the stations designated for the purpose are transmitting the "Top Radiotelegráfico."

ART. 21.—This decree to be communicated, published, etc., etc.

SUB-SECTION 7.

NATIONAL WARSHIP STATIONS.

ART. 1.—Warship and coast stations shall use for official messages the maximum wavelength possible for their aerials, and should they have to transmit messages to Argentine merchantmen or to foreign merchant steamers they must use the wavelengths specified by the London Convention and by these Regulations.

ART. 2.—In order to avoid difficulties in the general radiotelegraphic service arising from the use by and between Navy units employing Wireless, and which work with the normal wavelength (600 metres)—thus producing interruptions that prevent the reception of other radiograms—this method will be followed, namely:—

1. For Wireless communications in general, between Navy units, their station shall employ the following wavelengths:—

1,000 METRES: Ships *Moreno, Rivadavia, General San Martin, General Belgrano, Pueyrredón, Garibaldi, Buenos Aires, 9 de Julio, Presidente Sarmiento, Pampa, Chaco.*

450 METRES: Ships *Almirante Brown, Libertad, Independencia, Paraná, Rosario, Patria, Córdoba, La Plata, Catamarca, Jujuy, Entre Rios, Misiones, Corrientes, Guardia Nacional, 1° de Mayo, Ministro Ezcurra, Alférez Mackinlay, Ona, Querandi, Azopardo, Piedra Buena, Vicente Fidel López, Uruguay, and Gaviota.*

2. When the distance between ships does not allow of the establishment of wireless communication with the wavelength mentioned above (No. 1) the operator shall use the efficient wavelength that his apparatus may permit.

3. The normal 600 metres wavelength shall be used exclusively for general service between ships and land stations, national or foreign.

4. After the radiotelegraphic communication is established by any means as mentioned above (Nos. 1 and 2), the operator shall endeavour to work, considering the range, with the minimum power required for obtaining effective communication in accordance with the provisions of the London Radiotelegraphic Convention.

5. The syntonisation of the radiotelegraphic stations on board ships of the Navy, shall be controlled and regulated by the Radiotelegraphic Service Department, in accordance with the wavelengths established by Art. 1, and taking into consideration the normal wave of 600 metres.

SUB-SECTION 8.

WIRELESS ON MERCHANTMEN.

ART. 1.—All merchant vessels, whether mechanically propelled or otherwise, carrying fifty or more persons (passengers and crew) must be fitted with a wireless installation in perfect working order, except in the cases referred to in Articles 4, 5 and 6, below.

The above applies to all craft in similar conditions entering or leaving Argentine ports.

ART. 2.—Wireless apparatus in charge of an efficient operator must have at all times a transmitting power of no less than 200 kilometres for river craft and of no less than 500 for sea craft.

ART. 3.—No ships will be allowed to clear when the above provisions have not been duly complied with, and should captains or ship masters endeavour to avoid or contravene this rule the Superior Port Authority can impose a fine of not less than 1,000 pesos and not exceeding 5,000. Those penalised in that way can appeal to the Federal Court having jurisdiction on the locality where the fault has been committed. The fine will be doubled in cases of repetition of the offence.

ART. 4.—Ships exclusively navigating the rivers of the Republic are exempted from the obligation of carrying wireless on board, but those plying between Argentine and Uruguayan ports on the River Plate and those

employed in the coasting trade must carry radiotelegraphic installations.

ART. 5.—The following are the exceptions to the rule established by Article 1 :—

(1) Those ships which only by accident or under exceptional circumstances carry fifty or more passengers, either because the captain has been obliged to get extra help in order to replace the sick members of the crew, or because he has taken aboard the passengers and crew of some vessel in distress.

(2) Those ships on which, by reason of the route they follow or because of the conditions on which they set out to sea, it may be considered that the carrying of a wireless installation would be useless and superfluous.

(3) Those ships where the number of passengers may be raised by exceptional or accidental circumstances to 50 or more, owing to their having received on board these additional passengers in the course of the voyage for the purpose of transhipment, with the additional proviso that such vessels do not go farther than 150 miles from the nearest coast.

(4) Sailing ships of primitive construction such as pontoons and lighters, when it is impossible to fit them with wireless.

ART. 6.—Vessels which have started their voyage without meeting the requirements of these regulations cannot be observed or attended to if, by reason of bad weather or through *force majeure*, they are compelled to seek refuge in Argentine ports.

ART. 7.—All foreign ships carrying wireless installations are divided into three classes according to the classification made regarding ship stations in Article XII of the Regulations annexed to the Radiotelegraphic Convention signed in London on July 5th, 1912. These classes are :—

FIRST CLASS.—Vessels carrying a permanent wireless service.

All vessels fitted to carry 25 or more passengers are included in the *First Class*—

(1) If their average speed be of 15 knots or more.

(2) If they have an average speed of over 13 knots; but only provided they carry 200 or more persons (passengers and crew), and provided also that they traverse a distance of more than 500 nautical miles between two ports of call. These ships, however, may be classified under the second class provided that they maintain a continuous watch.

SECOND CLASS.—Vessels having a limited wireless service.

Those ships fitted to carry 25 or more passengers which for some other reasons may not have been included in the first class are included in this second class.

All ships of the second class must, whilst at sea, keep continuous watch during seven hours every day, and watch also for ten minutes at the beginning of each of the remaining seventeen hours.

THIRD CLASS.—To this class belong those ships, national or foreign, carrying a wireless installation without any fixed working hours or not included in the first and second classes.

The owner or builder of a ship included in the second or third class has the right to demand that in the certificate of safety issued to him mention be made of the fact that the ship belongs to a higher class, provided the vessel fulfils the requirements laid down for the higher class.

ART. 8.—National and foreign ships carrying wireless must keep a constant watch in the following cases :—

(1) Passenger ships running to Montevideo.

(2) All ships belonging to the first class.

(3) Ships belonging to the second class, whenever they are at a distance of over 500 miles from the nearest coast.

(4) (*a*) Ships carrying more than 50 persons and which, by reason of their movements, are obliged to navigate at a distance of over 1,000 miles from the nearest coast.

(*b*) Fishing craft, including whalers, on board of which wireless telegraphy must be carried, are not obliged to keep a continuous watch.

(*c*) The continuous watch above referred to must be carried out by two or more first-class qualified telegraphists, as provided for in Article X of the Regulations annexed to the Convention.

ART. 9.—Any ship which must carry wireless and which is classified in the first or second class must have an emergency installation, in accordance with Article XI of the Regulations annexed to the Radiotelegraphic Convention.

In every case, the emergency installation shall be placed in its entirety on the upper deck of the ship and should be located as high up as possible.

The emergency installation must have a source of energy of its own, must be of such a nature that it can be set in motion very rapidly, and must be capable to work for a minimum of six continuous hours and possess a range of 150 kilometres.

This emergency installation is not required in the case of those ships whose *normal* installations fulfil all the requirements demanded by this Article (as enumerated in the preceding clause).

The license referred to in Article IX of the Regulations annexed to the International Radiotelegraphic Convention cannot be granted if the installation fails to comply with the requirements demanded by the said Convention and by the present Regulations.

ART. 10.—All points raised in the Radiotelegraphic International Convention and its Regulations which affect ship stations, the transmission of messages, and the issue of certificates to wireless operators, are governed by the following :—

(1) The Rules laid down in the abovementioned Convention and its Regulations, as well as all the amending Regulations which may from time to time be substituted for them.

(2) The present Regulations whenever their provisions can be considered as additions to the above.

SUB-SECTION 9.

RULES FOR WIRELESS INSTALLATIONS ON NATIONAL MERCHANTMEN.

ART. 1.—All Shipping Companies whose vessels are included in the Regulations laid down in Wireless Law No. 9127 must obtain a permit from the Ministry of Marine and through the Prefect-General of Ports for the installation of wireless stations on their ships.

ART. 2.—Wireless stations on national ships devoted to the conveyance of passengers will be classified as belonging to the first class, and wireless stations on cargo boats will be included in the second class (Article XIII of the Service Regulations annexed to the Wireless Convention).

When Shipping Companies apply for permission to instal wireless in their vessels they

must indicate the class occupied by such vessels, and this classification must be verified by the Office of the Prefect-General of Ports before forwarding the application to the Secretary-General of the Ministry of Marine.

ART. 3.—As soon as the permit has been granted, and immediately after the stations have been erected on the ship, the company must notify the Prefect-General of Ports, so that the latter may—after previous inspection by the wireless inspector—issue the corresponding licence through the Chief of the Maritime Wireless Service. This licence will be handed over as soon as the charge of 5 pesos (national currency) for the defrayment of expenses has been paid.

ART. 4.—The Ministry of Marine will grant the license :—

(a) If the wireless installation fulfils all the requirements of the law in the matter of range and also if the installation belongs to a system permitting of its being tuned to the wavelengths specified in the London Wireless Convention, within an approximation of 5 per cent.

(b) If a deposit to the order of the Director General of Posts and Telegraphs has been made in the "Banco de la Nación Argentina" of the amount previously fixed by this office as a guarantee for the exchange of radiograms. This deposit must amount at least to one hundred pesos, national currency.

(c) The depositors shall not dispose of the deposit (as provided in (b)) unless they previously notify the administration that their vessels are going to discontinue their registered service, and that sufficient time has elapsed to effect the final liquidation of accounts for radiograms exchanged.

(d) Stations on board ships from a country with which no agreements have been entered into for the exchange of radiograms (between our stations and its ships), will be subject to the conditions (b) and (c). In this case the deposit must be made, before any service is rendered, by the agents of the shipping company owning the vessel.

ART. 5.—Wireless installations on ships belonging to the national merchant service must be furnished with the following papers :—

(1) The license authorising the installation.
(2) One copy of the London Wireless Convention.
(3) One copy of the Wireless Law.
(4) One copy of the Wireless Regulations.
(5) The Official List of Wireless Stations. and alphabetical list of call letters.
(6) Radiogram forms.
(7) One copy of the standing wireless rates, which must be kept where it can be plainly seen.
(8) One slate, placed outside the wireless cabin, so that the names of those stations within range may be noted thereon for the information of the public.

ART. 6.—The stations on board national merchantmen must be disposed in such a way that the State's stations may receive the waves emitted by the former.

ART. 7.—Radiotelegraphists are forbidden to operate in unlicensed stations.

It is their duty to report to the Prefect-General of Ports any tentative to compel them to disregard this prohibition.

ART. 8.—(a) When a "license" is issued the station receives its call letters, which will be published in the Official List of Radiotelegraphic Stations issued by the Berne International Telegraphic Bureau.

Stations licensed for public service "must not use," not even for private purposes, other call letters than those assigned them by the Director of the Maritime Public Radiotelegraphic Service.

(b) The operators in charge of the stations will be responsible for any infringement of the above provision.

ART. 9.—(a) Operators in charge of public service stations are responsible to the Director of the Maritime Public Radiotelegraphic Service for the fulfilment of the provisions contained in the Regulations in force at the time and in the International Radiotelegraphic Convention.

The manager of a station is the chief of the staff serving in the same, and if it is a ship station the manager is responsible to the ship's captain.

The operator in charge of a ship station owes obedience to the captain, and if the latter gives an order against the rules or the International Convention, the operator has the right, acting with tact and courtesy, to call the captain's attention to the fact, pointing out to him at the same time how to avoid the infringement of the rules in carrying through the order received.

(b) The operator in charge shall keep a "book of orders of the station," the pages of which must be numbered. It is forbidden to detach leaves from this book and to use erasers on its pages.

A record will be kept in this book of all orders received from officers with authority to issue them, such as the ship's captain, his substitute, the inspectors representing a Prefect of Ports, etc. Every order will be marked with a number, and in a marginal note the operator will state the date and hour in which it was received; also the place, whenever possible.

The book of orders will be considered as an official document jointly with the "watch book" (*libro de guardia*). The two books will be referred to in case of a lawsuit originated from infringement of the regulations or through other causes.

Whenever required by a competent authority this book shall be submitted for inspection.

Opposite the order (to this effect), in a marginal note, the operator will record the date and hour in which he complied with it.

(c) The operator in charge is responsible for the "service" of the station; therefore, he must see to it that all measures are taken to insure the most efficient service the class of the station calls for—as given in the licence issued by the Director of the Maritime Public Radiotelegraphic Service.

(d) Only the operator in charge is responsible for the accounts or bookkeeping of the station and, unless express orders to the contrary are given, he must prepare the balance-sheets and vouchers thereof.

ART. 10.—The operators in charge of a radiotelegraphic station where an emergency station has been installed according to specifications in the Convention, must verify the perfect running of the emergency station before weighing anchor. The experiments to be carried in this case will be purely local, being limited to the test of the generator, the oscillating circuit and the receiving apparatus.

However, if the operator in charge is in

doubt as to the range or satisfactory running of the whole set, he may ask any coast station to listen to his call in order to perform any test he may judge necessary. When acting in this way the operator will use the abbreviations given in the international list.

The test will be carried through in this way: the operator will ask for a certain time (*un cierto tiempo*) the transmission of the signal • • • ▬ • in order to verify the receiving set; afterwards, the operator will send the same signal using the emergency transmitting apparatus, thus testing its efficiency and the wavelength.

The operator of the station will record in his "watch book" all the remarks suggested by the test and the result of same. If the emergency station is found deficient in some respect, the operator will report to the captain so that he may give the necessary orders to have it repaired and in working order, according to the International Convention.

ART. 11.—When a national merchant ship happens to enter a zone where naval manœuvres are being performed by men-of-war using their wireless, the merchant ship must ask for a licence from the chief of operations to send her messages to the land stations, and in so doing she must state the approximate time that will be required to transmit the traffic in hand.

In these communications both the man-of-war and the merchant ship will use the prefix "T.R."

ART. 12.—Whenever these Regulations are infringed information about the facts will be gathered, and in view of the evidence fines will be imposed, according to the national and international laws and regulations governing the telegraphic and radiotelegraphic services. The payment of the fines will not prevent further legal action, as may be required by the nature of the fault.

A "license" may be cancelled if the findings in the summary show the convenience of so doing.

SUB-SECTION 10.

OFFICIAL CLASSIFICATION, RATES, COLLECTIONS, AND ACCOUNTS IN ALL KINDS OF RADIOTELEGRAPHIC STATIONS.

ART. 1.—To make up and liquidate the accounts concerning radiograms received from the public at the coast stations, the following method will be observed:

(*a*) If there is no postal or telegraph office in the locality, the money corresponding to this service will be paid to the Post and Telegraphs Treasury through the Administrative Section under the Director-General of the Ministry of Marine.

(*b*) If there is a postal or telegraph office in town, the payments referred to in (*a*) will be made to it, daily, the wireless coast station getting a receipt for every remittance.

(*c*) In places where there is a telegraph office, the coast station shall receive messages from the public when the former is out of connection with the telegram system, and the tolls collected will be paid by the latter to the telegraph office, as stated in (*b*).

ART. 2.—Radiograms from the personnel of the national Navy and ships belonging to other State services will be exempted of the tolls caused at the State ship and coast stations, but not of those corresponding to the land lines.

When such radiograms as those referred to in this article do not use land lines, their transmission will be charged according to the lowest (*simple*) telegraph rates.

ART. 3.—The personnel of the Navy shall be able to make use, without charge, of radiotelegraphy for affairs of service connected with their functions, providing that the interchange is effected directly between stations of the Navy and without the intervention of any other system of communication. This class of radiotelegram shall bear the prefix "R.S.," and will not be forwarded without the sanction of the officer in command. As regards transmission, they will take priority over the "D.P." radios.

ART. 4.—The collection of tolls on private radiograms from ships of the Navy or other public services is subject to the following rules:—

(*a*) Radiograms from the personnel mentioned in Art. 2 and those addressed to any of the national wireless stations to be forwarded by land lines to men in the service, are subject to the ordinary telegraph rates and the amount in full must be paid to the operator or chief of the station, just as telegraphic messages are paid for in land offices. The operator will issue in every instance a receipt of the amount collected.

(*b*) Every day the operator in charge will hand over to the ship's purser the money received for private messages sent out, and the purser will give a receipt of the amount.

(*c*) The pursers of ships stationed between La Plata and the Buenos Aires ports will pay out every month to the Arsenal Administrative Department the money received from the operators in charge. This payment to be made according to paragraph (*a*), Art. 1, of this Sub-section.

(*d*) The same operation will take effect every month in the arsenal and ships anchored in the military port, where the Administrative Department will hand over the money received directly to the Telegraph office at that port.

(*e*) In the case of ships out at sea, the deliveries of money will take place as stated in paragraphs (*c*) and (*d*), the payments to be made within twenty-four hours of arrival at their jurisdictional port, if such arrival occurs after the day fixed for settlement of accounts.

ART. 5.—Any claim arisen from differences in the accounts submitted will be presented by the Director-General of National Posts and Telegraphs to the Chief of the Maritime Public Radiotelegraphic Service.

ART. 6.—Ships and service sections with wireless stations belonging to Ministries (other than the Interior and Marine) will settle the radiotelegraphic accounts according to agreements they will enter into with the Director-General of Posts and Telegraphs.

ART. 7.—Shipping companies will settle monthly their accounts with the Administration of Posts and Telegraphs. The settlement will be made according to the statement of account that the latter office will prepare and forward to every shipping company.

ART. 8.—Telegraph and radiotelegraph rates at present in force are those published in the pamphlet "National Postal and Telegraphic Schedule of Charges" 1917 edition, and in the "Official List" of International Radiotelegraphic Stations.

National stations will apply the rates therein given.

ART. 9.—With the amount of tolls collected in the public service by the State's and National Shipping Companies' stations (which amounts

are paid to the Administration of Posts and Telegraphs as provided in these Regulations) the following documents will be submitted: the list of radiograms exchanged with the necessary information to identify them, and the original of every message sent, relayed and received.

These originals will be placed in a sealed envelope, to be opened only by the Administration of Posts and Telegraphs.

ART. 10.—One copy of the list (mentioned in Art. 9) shall be sent in the first five days of every month to the Radiotelegraphic Department, Ministry of Marine. Shipping companies' stations shall forward these lists through the office of the Prefect-General of Ports.

ART. 11.—A separate list will be made of the official radiograms exchanged between the Navy units and between these units and the national coast stations, when the last is their final destination. This list will be sent only to the Radiotelegraphic Department, also in the first five days of every month, and must be accompanied by the originals of the radiograms exchanged (received, relayed, and transmitted) as provided by Art. 9.

ART. 12.—Coast and ship tolls will be liquidated between the Director-General of Posts and Telegraphs and the foreign administrations or companies controlling the stations intervening in the exchange of radiograms, according to Art. XIII of International Radiotelegraphic Regulations.

ART. 13.—The tolls collected on account of public service radiotelegrams exchanged direct between ships owned by the same company shall not be paid to the Administration of Posts and Telegraphs, but the corresponding list of messages and their originals shall be supplied as provided above.

ART. 14.—The accounts for direct radiotelegraphic exchange between Argentine merchant ships or between Argentine and foreign ships will be settled between the respective companies, and to this effect in each case the receiving station will make the corresponding charge to the transmitting station, but the list of messages and the originals of the messages exchanged will be supplied by the stations on board national ships.

ART. 15.—The Director-General of Posts and Telegraphs shall include in the official list of telegraphic offices the data *re* national licensed coast and ship stations existing in the country, and the list will be kept for reference and consultation by the public at every telegraph office in the Republic. The necessary information to prepare this list—as detailed below—will be supplied by the Ministry of Marine to the Director of Posts and Telegraphs, viz.:—

(*a*) *Inland and Coast Stations*.—Name, geographical position as shown by the territorial sub-division of the country, and longitude and latitude of the place.

Ship Stations.—Name of the vessel, and—if essential—name of the owner or owners.

(*b*) Call letters. (Every group of call letters must contain three letters and shall be differently arranged for each station.)

(*c*) Normal range.

(*d*) Radiotelegraphic system employed and characteristics of the transmitting set.

(*e*) The several wavelengths employed by the station. The normal wavelength to be underlined.

(*f*) Class of service rendered by the station (communication with ships, general public correspondence, private correspondence, long-distance public correspondence, special correspondence, exclusively official, etc.).

(*g*) Service hours of the station.

(*h*) The time and how the signals are sent out, and the meteorological notices, when the station attends to this kind of service.

(*i*) Coast and ship rates.

The list will contain, as well, the information communicated to the Berne Bureau relating to radiotelegraphic stations not opened for general public correspondence.

In designing radiotelegraphic stations, the following abbreviations will be made use of:—

PG—Station open to general public correspondence.

PR—Station open to restricted public correspondence.

P—Private station (*Estación de interés privado*).

O—Station open exclusively to official correspondence.

N—Permanent Service Station.

X—Station without fixed hours service.

In cases of homonymy, the name of a ship station will be immediately followed—in the first column of the list—by the corresponding call letters.

ART. 16.—In the counting of words to collect the tolls, the rules given in the regulations annexed to the Petrograd Convention will be followed.

ART. 17.—The originals of public service radiograms and all documents appertaining to same will be safely kept by the Direction-General of Posts and Telegraphs during fifteen months, counting from the month following that in which the originals were received at that office.

ART. 18.—Reimbursements originated by the exchange of radiograms with the State's stations will be settled in accordance with the provisions of the International Telegraphic and Radiotelegraphic Convention.

ART. 19.—In the application of the schedule of charges corresponding to messages issued from or addressed to radiotelegraphic stations established in places where no telegraph office is in existence, such stations will be considered as national telegraph offices and the radiotelegraphic rates will be applied only to messages exchanged with ship stations.

CHAPTER III.

NAVY RADIOTELEGRAPHIC STATIONS SERVICE.

SUB-SECTION I.

STATION'S STAFF—DUTIES AND POWERS.

ART. 1.—The staff in every station will consist of one operator in charge and the number of subordinate trained operators required to keep the watch. The number of these operators will be fixed by the Radiotelegraphic Department.

In case of vacancy or temporary absence from the station of the operator in charge, his place will be filled by the operator of highest category or, between men of the same category, by the senior in the service.

Operators in charge shall depend directly from the signal officers.

ART. 2.—The operator in charge is responsible to the Department or to the signal officers—as the case may be—both for the proper

running and upkeep of the station apparatus and for any lack of attention in the performance of the service. The operator in charge, however, may have the responsibility devolved upon the subordinate who was in the watch at the time the breakdown or inattention took place.

ART. 3.—When the station is short-handed the operator in charge will do watch duty as the subordinate, but the former will be at liberty to choose the hours for his watch.

ART. 4.—The hours of watch corresponding to each operator will be fixed beforehand, considering the class of service to be rendered and the number of men on the staff of the station.

ART. 5.—Ship commanders or managers of other public services have authority to increase temporarily the staff of the stations depending from them, when, on account of manœuvres or other similar service, they consider it essential to insure efficient communications.

ART. 6.—To define justly the responsibility attaching to each operator in connection with breakdowns in the apparatus or omissions in the fulfilment of duties, each operator on taking up his watch will sign in the watch book an entry stating the condition in which he receives the apparatus, the hour of his coming in and all other particulars that may help later on to establish responsibilities. This entry shall be signed also by the operator leaving the work.

ART. 7.—Every time a watch is relieved the operator going out will communicate to his relief all information in his possession concerning the service and useful in the proper performance of the duties.

ART. 8.—When, on account of atmospheric discharges, it is dangerous to keep the apparatus ready to work, the antenna shall be connected to earth, and this fact will be recorded in the watch book stating the hour in which the interruption took effect and that in which connection for work was re-established. During the period of interruption, the operator shall test the atmospheric conditions every thirty minutes, and he will reconnect the antenna immediately the discharges cease.

ART. 9.—The managers of special services and the commanders of ships shall see that the archives of radiotelegrams—official and private—are kept in due order and with all the information required; also the stub-book of receipts. To this effect the signal officer or the officer in charge of the bookkeeping will inspect the station with due frequency.

ART. 10.—The *Dársena Norte* station is the "Service Central Station," and upon its call the other stations shall stop their communications unless the messages are *very urgent*, in which case the transmission shall be carried on to the end. "Very urgent" messages are those asking for assistance and those transmitting orders from H.E. the President of the Republic, the Minister of Marine and the commanders of fleets engaged in manœuvres.

ART. 11.—Time service in force for coast and fixed ship stations is as follows:—

Station	Hours
Dársena Norte	Permanent (N)
Rio Santiago	
Faro Recalada (*Recalada Lighthouse*)	0900—1100, 1400—1600, 2000—2400.
Pontón estacionario de Prácticos (*Stationary Pilots' Pontoon*)	" "
Faro Mogotes (*Mogotes Lighthouse*)	Permanent (N)
Puerto Militar (*Military Port*)	" "
Comodoro Rivadavia ..	" "
Cabo Virgenes	" "
Año Nuevo	1800—0600
Rio Grande	0600—1800
Ushuaia	Permanent (N)
La Paz	2400 – 1200
Posadas	" "
Formosa	" "
Puerto Aguirre	" "
San Julian	Permanent (N)

ART. 12.—Commanders of ships navigating along or towards Argentine coasts will have observed on their "R.T." stations the following hours:—

Ships with three or more radio-telegraph operators.	Permanent service.
Ships with two operators ..	0700—1100
" " " ..	1400—1800
" " " ..	2000—2400
Ships with one operator ..	0800—1100
" " " ..	1400—1600
" " " ..	2100—2300

Whenever a complaint is made, a full explanation as to the reasons of delay or other cause of complaint shall be given, and to this effect a record of the facts will be entered in a special Watch Book. This book will be kept by the operator in charge and viséed by the signal officer. Coast stations may call at any hour the ship they want to communicate with. In case of delay, the coast station will regulate its work so as to pick up the ship station at the first opportunity.

Ship commanders may call at any hour the permanent service stations, but, in normal circumstances, they should arrange their calls to other stations in accordance with the latter's hours of working.

Calls for assistance are to be made at any time they are required.

Stations with intermittent service shall attend an urgent call the moment it is heard, whether or not within their regular service hours.

For the purposes of this Article the hour is four hours later than G.M.T.

SUB-SECTION 2.

GENERAL RULES.

ART. 1.—It is absolutely forbidden to the operators to maintain dialogues by wireless; their conversations will, in every instance, be limited to the subjects strictly essential to render a good service.

ART. 2.—Whenever a radiogram is transmitted with a delay of more than thirty minutes after it was handed in, it shall be endorsed with an explanation of the delay which is to be recorded in the watch book.

ART. 3.—When a station calls repeatedly for another and cannot get an answer in more than five minutes, the fact will be recorded in the watch book and also the object of the call. Other stations within the range of the calling station shall record, as well, the call and the omission to answer it. These records will serve to establish the responsibility for possible delays in the transmission or reception of messages.

ART. 4.—When a station "causes a wait" (*da una espera*) of more than ten minutes, the two stations concerned shall record the fact in their respective watch books, the transmitting station giving the classification of the radiogram it has for transmission, and the receiving station the cause of the "wait."

The transmitting station shall remind every ten minutes the receiving station of its being waiting, and the reminders will continue until the radiogram in hand is transmitted.

ART. 5.—Whenever trouble occurs in the receiving apparatus causing a delay of more than ten minutes, a record of the nature of the trouble will be made in the watch book in order to fix responsibilities. The operator in charge will make a similar record whenever he is unable to answer a call through lack of current in the transmitting set, the burning out of a fuse, or other like accident.

ART. 6.—While two stations are in communication, it is absolutely forbidden to the others to interrupt them by calling out a third station, unless the call is to transmit a "very urgent" radiogram or a "general call" from the flagship. However, even in the cases just mentioned the interruption should be made only at the moment the station that is sending messages completes one of them. When this is accomplished the interrupting station shall give the signal of general interruption and the prefix corresponding to either of the very urgent messages above mentioned, which are to have priority in transmission and reception.

ART. 7.—When a ship moors at a port, Navy yard or dockyard, her wireless plant will be closed after a thorough cleaning of its parts.

ART. 8.—To avoid the damages which are likely to occur in wireless stations of resonant spark, on account of the spark gaps being short circuited, the electrodes shall be thoroughly cleaned once a week.

The officer on duty shall be present at the cleaning and will see that it is made properly and thoroughly. To ascertain that the operation has been carried through without impairing the efficiency of the apparatus, the officer will remove the mica washers and will see whether—without them—the contact between each pair of electrodes is perfectly uniform both in the copper rings and the silver discs.

ART. 9.—Radiograms referring to urgent family matters of men in the Navy service, and issued from a Navy ship Dársena Norte station, may be sent thence to destination by telephone, if the sender so desires. This will not alter the charges provided the expression "T.C. Naval" follows the signature.

ART. 10.—Arsenal and dockyard commanders shall take care that the radiotelegraph operators under their command attend in the most thorough manner to the cleaning and maintenance in good order of wireless apparatus on board ships anchored therein. The same commanders will see to it that the operators practise with reasonable frequency in sending and receiving messages.

ART. 11.—It is the duty of the staff of a ship station anchored in a Navy yard or military zone to serve in the land stations in the neighbourhood. If one of the latter is closed for repairs, the operators shall report for duty at the station on board the ship appointed to replace the temporarily closed station.

When the number of available operators is rather large, the commander of the Navy yard or the military zone will appoint the hours of service corresponding to each operator.

ART. 12.—Complaints referring to misdirected, altered, or delayed radiograms should be forwarded by the sender of the message to the captain of the ship whence it was transmitted.

The complaint must contain the number of the radiogram, the hour of transmission, the receiving station, and the name and address of the addressee.

The ship commander will give the necessary instructions to have the information supplied duly checked and all the papers referring to the case shall be sent to the Secretary-General of the Ministry.

Every complaint must refer to one radiogram only.

SUB-SECTION 3.

SPECIAL BOOK-KEEPING OF THE NAVY STATIONS.

ART. 1.—All coast and ship stations shall forward to the Radiotelegraphic Department, Ministry of Marine, in the first five days of every month, two copies of the sheets showing the monthly traffic of both official and public radiograms.

The same stations shall forward, every quarter, a statement of the supplies spent and a requisition of the supplies wanted.

ART. 2.—As often there are divergencies in the international radiotelegraphic service as to the number of words contained in the radiograms sent and received abroad through stations in national men-of-war, these ships shall forward to the Radiotelegraphic Department, Ministry of Marine, an authenticated copy of every message exchanged between them and foreign stations.

Such copies shall be forwarded immediately after the arrival of ships in home waters, so that the Department will be in advance in a position to answer the Administration of Posts and Telegraphs consultations on this subject.

ART. 3.—In all matters relating to management and book-keeping, independent radiotelegraphic stations shall address direct to the Radiotelegraphic Department.

DECREE NO. 1 OF OCTOBER 13, 1919.
Buenos Aires, October 13th, 1919.

The Executive Power of the Nation decrees

ART. 1.—All restrictions imposed having reference to the use of radiotelegraph installations on merchant vessels are removed.

ART. 2.—Merchant vessels shall not make use of their transmitting apparatus on entering the zone comprised within a radius of five nautical miles of the radiotelegraph stations open to public service, and during such period as they remain in that zone. Nevertheless they shall be able to use their transmitters in case of urgent necessity to make calls for assistance.

ART. 3.—A final period of six months is granted for Argentine merchant vessels to comply with the conditions stipulated by the General Regulations of the Radiotelegraph Service.

ART. 4.—At the General Prefecture of Ports an Office of Radiotelegraph Inspection shall be brought into operation which will see that merchant vessels comply with the stipulations of the International Radiotelegraph Convention of London and the General Regulations as regards the Radiotelegraph Service.

ART. 5.—This decree to be communicated, published, etc., etc.

(Sd.) IRIGOYEN, JULIO MORENO.

DECREE NO. 2 OF OCTOBER 13, 1919.

Buenos Aires, October 13th, 1919.

The Executive Power of the Nation decrees:

ART. 1.—Authorises the "División Servicio Radiotelegrafico" to arrange for the Radio-telegraph Works of the Navy to carry out, on board merchant vessels entering the ports, all work that may be required by the radio-telegraph stations of those vessels.

ART. 2.—On the termination of the work the amount incurred as regards wages and materials with an additional charge of 10 per cent. as compensation for the use of machinery and costs of administration shall be liquidated the amount in question to be paid by the captain or shipowner before the vessel leaves the port.

ART. 3.—The sums collected in this manner shall be paid over by the "División Servicio Radiotelegrafico" to the Treasury of the General Administrative Authorities, so that in due course they may be paid to the General Treasury of the Nation and credit granted for the items destined for the radiotelegraph stations of the Navy.

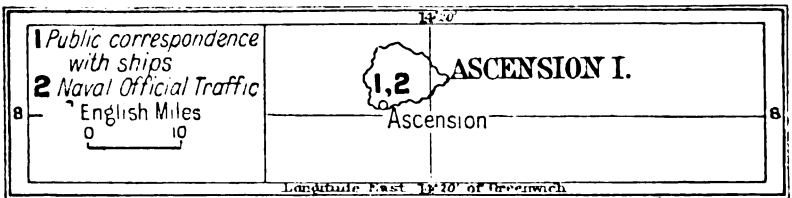
ART. 4.—The Radiotelegraph Inspectorate of the General Prefecture of Ports shall make this Decree known to captains and shipowners.

ART. 5.—This decree to be communicated, published, etc., etc.

(Sd.) IRIGOYEN, JULIO MORENO.

ASCENSION ISLAND

THIS isolated island lies, at its nearest point, about 900 miles from the mainland of Africa (Liberia) and possesses something less than 200 inhabitants. The wireless telegraph station belongs to, and is worked by, the Admiralty, but normally is open to public correspondence with ships. At the present time this station is temporarily closed down, and is in charge of a care and maintenance party.



Longitude is West, not East of Greenwich.

AUSTRALIA

THE area of the continent itself is 2,948,366 English square miles, whilst the inclusion of the island of Tasmania, which possesses an area of 26,215 square miles, brings the gross superficies to a total of 2,974,581 square miles.

The Government is a Federal Commonwealth Government—the Executive power vested in the Sovereign (acting through the Governor-General) assisted by the Executive Council of seven Ministers of State and such honorary Ministers as may be appointed thereto. The constitution rests on the fundamental law of March 16th, 1898, ratified by the Imperial Parliament on July 9th, 1900, and the Commonwealth was inaugurated January 1st, 1901.

CONTROL AND ORGANISATION.

Originally radiotelegraphy was organised in Australia under the supervision of the Postmaster-General, the Naval Department exercising jurisdiction independently over their own radiotelegraph stations. In 1915 this duplication was abolished; the control throughout the entire Commonwealth being definitely placed in the hands of the Naval Authorities. With the cessation of hostilities, however, the control of radio activities again reverted from the Department of the Navy to that of the Postmaster-General, the transfer dating as from the 28th October, 1920. The first sets erected were those at Point Lonsdale, in Victoria, and that near Devonport, Tasmania. Both of them date from 1905.

The land stations controlled by the Government are twenty in number. In addition to these it is anticipated that seven stations established

in late German New Guinea and neighbouring Pacific Islands, now held by the Commonwealth of Australia under mandate from the League of Nations, will be brought under the control of the Commonwealth Radio Administration in the near future, and will be counted as part of the Commonwealth radio service.

There are no private land stations in actual operation, but a proposal to use radio as a means of communication in the interior of the continent has been launched, and rapid development is anticipated when the advantages of the system become apparent. It is proposed to instal a Government Station in connection with the landline system. This Government Station will operate as a collecting and distributing station for privately owned and operated stations within its range. A liberal tariff has been proposed, and every encouragement is being given to settlers to instal their own wireless stations.

There are a number of ship stations on Government vessels as well as on vessels privately owned.

The policy of the Radiotelegraphic Service is a progressive one, and it is intended to extend the use of radiotelegraphy and telephony wherever possible, so that the coming year will see considerable developments in its use.

ADMINISTRATION.

The Act to Regulate Radiotelegraphy in Australasia was passed in 1905. A number of additions and modifications were introduced by Wireless Telegraphy Acts No. 33 of 1915 and No. 4 of 1919, and this amended text will be found below, it being the extant Governing Decree under which wireless is at present administered.

In 1912 the Commonwealth Parliament passed the Navigation Act, wherein is contained a clause which makes it compulsory for ships trading in Australian waters to be fitted with radiotelegraphic apparatus. This is provided for in Section 231 of the Act, and the text of that section will be found below with other information in accordance with the following list, which includes the Regulations under Section 231 of the Navigation Act and "Navigation (Danger Calls) Regulations."

We append the text of current radiotelegraphic legislation in accordance with the following list:—

A—Wireless Telegraph Act, 1905 (No. 8), as amended by Act No. 33 of 1915 and Act No. 4 of 1919.
B—Wireless Telegraph Regulations, 1916 (embodying Amendments made up to Statutory Rule 68 of 1920).
C—Form of Ship License.
D—Form of Receiving License for Amateurs.
E—Form of Transmitting and Receiving License for Amateurs.
F—Navigation Act, 1912 (Sec. 231).
G—Navigation (Wireless Telegraphy) Regulations.
H—Amendment of the Wireless Telegraphy Regulations, 1920.
I—Amendment of Navigation (Wireless Telegraphy) Regulations. (Statutory Rules 1921, No. 104.)
J—Amendment of the Navigation Act, 1912—1920. (Second Amendment, 1921.)

ACT No. 8 OF 1905.

(As amended by the Wireless Telegraphy Acts, No. 33 of 1915 and No. 4 of 1919.)

A

1. *Short Title.*—This Act may be cited as the Wireless Telegraphy Act, 1905.

2. *Interpretation.*—In this Act—

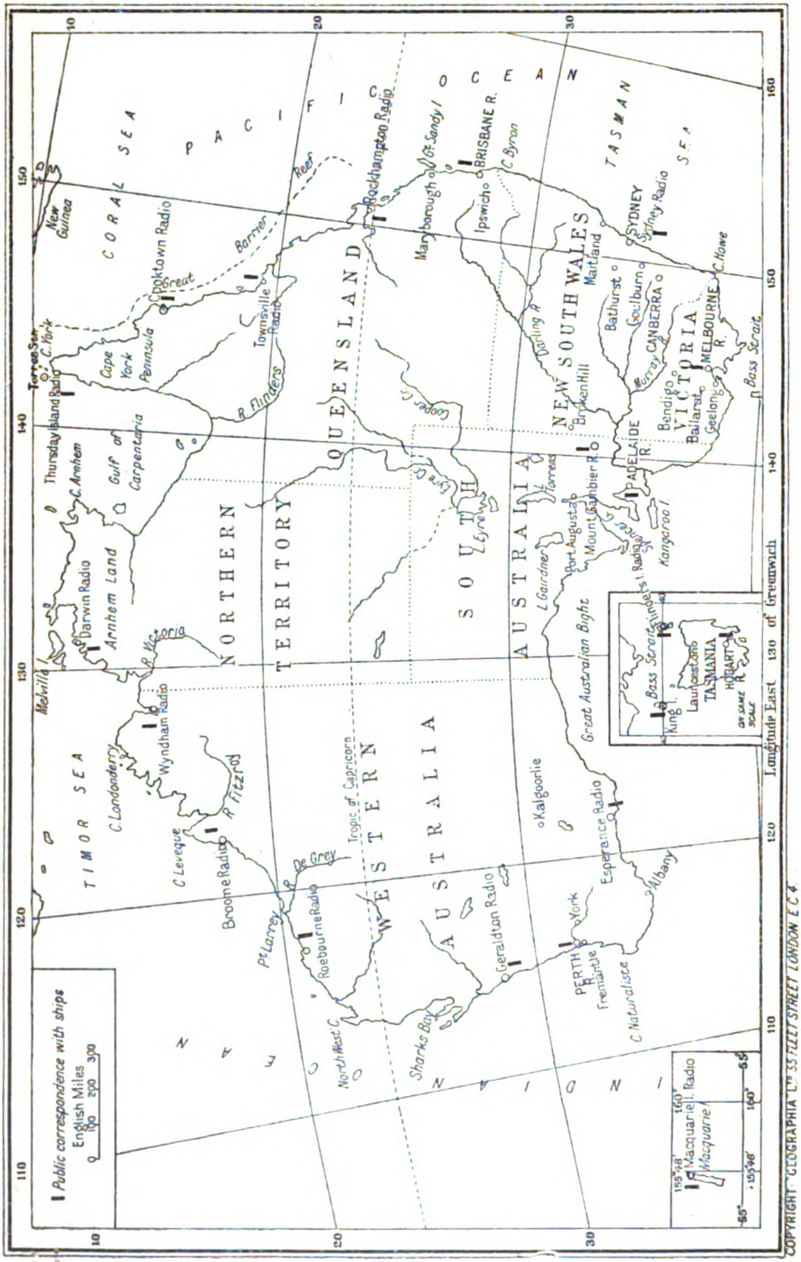
"Australia" includes the territorial waters of the Commonwealth and any territory of the Commonwealth;

"Wireless Telegraphy" includes all systems of transmitting and receiving telegraphic or telephonic messages by means of electricity without a continuous metallic connection between the transmitter and the receiver.

3. *Exemption of Ships of War.*—This Act shall not apply to ships belonging to the King's Navy.

4. *Exclusive Privileges.*—The Minister for the time being administering the Act shall have the exclusive privilege of establishing, erecting, maintaining and using stations and appliances for the purpose of—

(*a*) transmitting messages by wireless



(King Island, Mount Gambier and Roebourne stations closed.)

telegraphy within Australia, and receiving messages so transmitted, and

(*b*) transmitting messages by wireless telegraphy from Australia to any place or ship outside Australia, and

(*c*) receiving in Australia messages transmitted by wireless telegraphy from any place or ship outside Australia.

5. *Licenses.*—Licenses to establish, erect, maintain, or use stations and appliances for the purpose of transmitting or receiving messages by means of wireless telegraphy may be granted by the Minister for the time being administering the Act for such terms and on such conditions and on payment of such fees as are prescribed.

6. *Penalty for Breach of Act.*—(1) Except as authorised by or under this Act, no person shall—

(*a*) establish, erect, maintain, or use any station or appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy; or

(*b*) transmit or receive messages by wireless telegraphy.

Penalty: Five hundred pounds, or imprisonment with or without hard labour for a term not exceeding Five years.

Ships fitted with Apparatus for Wireless Telegraphy.—(2) Sub-section (1) of this section shall not, except as prescribed, extend to appliances maintained on any ship, arriving from any place beyond Australia, for the purpose of enabling messages to be transmitted from or received on that ship by means of wireless telegraphy, but all such appliances shall, while the ship is within Australia—

(*a*) be subject to the control of the Minister for the time being administering the Act; and

(*b*) only be used by his authority or as authorised by the regulations.

Penalty: Five hundred pounds.

7. *Forfeiture of Appliances Unlawfully Erected.*—All appliances erected, maintained, or used in contravention of this Act or the regulations, for the purpose of transmitting or receiving messages by means of wireless telegraphy, shall be forfeited to the King for the use of the Commonwealth.

8. *Search Warrants for Appliances Unlawfully Erected.*—(1) If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that any appliance is established, erected, maintained, or used in contravention of this Act or the regulations, for the purpose of transmitting or receiving messages by means of wireless telegraphy, he may grant a search warrant to any person.

(2) A search warrant under this section shall authorise the person to whom it is addressed to break and enter any place or ship, where the appliance is or is supposed to be, either by day or by ni ht, and to seize all appliances which appear to him to be used or intended to be used for transmitting or receiving messages by means of wireless telegraphy.

9. *Proceedings in Respect of Offences.*—(1) Proceedings for any offence against this Act may be instituted in any Court of Summary Jurisdiction, and any person proceeded against under this section may be dealt with summarily or may be committed for trial.

(2) The Court in dealing summarily with any accused person under this section may, if he is found guilty of any offence against this Act, punish him by imprisonment with or without hard labour for any period not exceeding six months, or by a penalty not exceeding Fifty pounds.

10. *Regulations.*—The Governor-General may make regulations, not inconsistent with this Act, prescribing all matters which by this Act are required or permitted to be prescribed or which are necessary or convenient to be prescribed for carrying out or giving effect to this Act.

DEPARTMENT OF RADIO SERVICE.

Regulations under the "Wireless Telegraphy Act, 1905-19."

Wireless Telegraphy Regulations.

Short Title.

1.—These Regulations may be cited as the "Wireless Telegraphy Regulations 1916."

Definitions.

2.—In these Regulations unless the contrary ntention appears—

"Australian ship" means a ship registered in Australia;

"British ship" means a British ship other than an Australian ship;

"Foreign ship" means a ship other than an Australian ship or a British ship;

"Harbour" includes any harbour properly so called, whether natural or artificial, or any estuary, navigable river, pier, jetty, or other work in or at which a ship can obtain shelter, or ship or unship goods or passengers;

"Land station" means a station, not being a ship station, for the transmission and receipt of messages by means of wireless telegraphy;

"Ship station" means a ship (not permanently moored) having installed thereon appliances for the transmission and receipt of messages by means of wireless telegraphy;

"Territorial waters" means the territorial waters of the Commonwealth and those of any territory of the Commonwealth, and includes harbours;

"The Act" means the "Wireless Telegraphy Act," 1905-1915;

"The Minister" means "The Minister of State for the Navy";

"Naval Board" means the Naval Board of Administration appointed under the Naval Defence Act;

"The Secretary for the Navy" means the Secretary to the Naval Board of Administration.

3. Repealed.

Licenses.

4. (i) Licenses under section 5 of the Act may be (*a*) ship licenses or (*b*) experimental and instructional licenses. Licenses shall be in accordance with the forms prescribed at the end of these Regulations.

(ii) A ship license shall be granted only in respect of a ship station on an Australian ship.

(iii) An experimental and instructional license may be granted to technical schools and similar institutions, and to persons for instructional purposes or scientific investigation of wireless telegraphy or wireless telephony phenomena, subject to the applicant producing satisfactory proof of his competency to conduct experiments scientifically.

(iv) A license shall be for a period of one year from the date thereof, and may be renewed from time to time.

Fees.

5. (i) The fee for a ship license shall be One pound, and shall be paid in advance.

(ii) The fee for an experimental and instructional license shall be Two pounds, and shall be paid in advance.

APPLICATION FOR LICENSES.

6. (i) An application for a ship license must be in writing, and must set out the following particulars :—

(*a*) The name of the ship in respect of which the license is applied for ;

(*b*) The port in Australia at which the ship is registered ;

(*c*) The system of wireless telegraphy to be used on the ship.

(ii) Before granting the license the Minister may require the applicant to furnish such additional particulars as he thinks necessary.

(iii) Experimental and instructional licenses shall only be granted to applicants who are natural-born British subjects, and who reside in Australia.

(iv) An application for an experimental and instructional license must be in writing, and must set out the following particulars :—

(*a*) Name in full, age, residence, previous training and present occupation, nationality, and parents' nationality.

(*b*) The scientific, technical, practical, or other grounds upon which it is desired to obtain a license ;

(*c*) Complete diagram of connection and description of the apparatus it is intended to use.

CONDITION AS TO SYNTONY, ETC.

7. Before any license is granted, the applicant must satisfy the Minister that the wireless telegraphy apparatus or appliances to be worked in pursuance of the license complies with the regulations for the time being in force governing syntony and wavelength.

8. (i) Every ship license shall be made out in triplicate. Two parts shall be issued to the licensee, and the other retained in the Department of the Navy.

(ii) Before the license is issued to the applicant he shall execute the part of the license to be retained in the Department.

RENEWAL OF A LICENSE.

9. (1) A license may be renewed by writing thereon or attaching thereto a memorandum stating the period for which it is renewed.

(2) The memorandum of renewal must be signed by the Minister or by the Naval Secretary.

(3) The renewal may be made at any time within one month before or one month after the expiry of the license.

(4) The memorandum is to be written on each part of the license, but in the case of the licensee's parts it shall be in the form of an official receipt for the renewal fee signed by the Minister or Naval Secretary, or by any person authorised to receive moneys on behalf of the Department of the Navy. Such receipts are to be attached by the licensee to the parts of the license in his possession.

REVOCATION OF LICENSE.

10. The Minister may, by notice in writing revoke and determine any license, on the ground of the licensee having failed to comply with any regulation for the time being in force under the Wireless Telegraphy Act 1905-1919, or on any other ground specified in the licence.

TUNED CRYSTALLITE RECEIVERS.

10A. (1) All vessels licensed under the Wireless Telegraphy Act 1905-1919 of the Commonwealth of Australia and fitted with wireless telegraphy installations operating or trading in the territorial waters of the Commonwealth or adjacent islands under the Commonwealth control shall be equipped with tuned crystalline receivers or receivers of the gas bulb or electrolytic type. Other receivers suitable for connecting to the detector terminals of the "Marconi" multiple tuner may be utilised when fitted with suitable transformer, and provided that the tuning and sensitivity are of equal efficiency to that obtained from a receiver specially designed for use with crystallite detectors.

(2) Vessels affected by this regulation shall take immediate action to comply with same ; but the Naval Board may, if circumstances of supplies warrant it, grant an extension of time for the fitting of the apparatus required by this regulation for a period not exceeding three months from the date of the issue of this regulation.

POWERS OF INSPECTION.

11. The Naval Board or any person authorised in writing by the Naval Board may at all reasonable times enter upon any ship or land station on which wireless telegraphy appliances are installed, or are in course of being installed in pursuance of a license, and may inspect such appliances and the working and user thereof.

COMMUNICATIONS BETWEEN SHIP AND LAND STATIONS.

12. When communications are made by means of wireless telegraphy between a ship (whether British, foreign or Australian) in territorial waters and a wireless telegraph station on land, the rules in force for the working of wireless telegraphy at that station shall be observed.

APPLICATION OF THE RADIOTELEGRAPHIC CONVENTION AND REGULATIONS.

13. The provisions of the Radiotelegraphic Convention and the Service Regulations for the time being in force thereunder, so far as such Convention and Regulations are applicable, shall apply to all wireless telegraphy installations available for the transmission or receipt of private messages, whether installed by the Commonwealth or under license, and whether at land stations or ship stations, and to all messages handled by such installations, and every licensee shall comply therewith.

APPLIANCES TO BE WORKED SO AS TO AVOID INTERFERENCE WITH OTHER APPLIANCES.

14. (1) The wireless telegraphy appliances on board any ship (whether an Australian ship, a British ship, or a foreign ship) in territorial waters shall be worked in such a way as not to interrupt or interfere with—

(*a*) Naval or Military signalling ; or

(*b*) the transmission of messages between other wireless telegraph stations.

(2) In this regulation Naval or Military signalling includes signalling or communicating, by means of any system of wireless telegraphy, by the King's Imperial or Dominion Naval or Military Forces.

APPLIANCES NOT TO BE WORKED WHILE SHIP MOORED TO ANY WHARF OR PIER.

15. Except by permission of the Naval Board, the wireless telegraphy appliances on board any Australian ship, British ship, or foreign ship (other than a ship of war) shall not be worked or used while the ship is moored to any wharf or pier in Australia or any territory of the Commonwealth.

APPLICATION OF DEFENCE REGULATIONS TO FOREIGN SHIPS OF WAR IN HARBOURS.

16. The use of wireless telegraphy appliances on board any foreign ship of war while in

any harbour in Australia or any territory of the Commonwealth, shall be subject to such rules (whether prohibitive or regulative) as the Governor-General may think fit to make.

POWERS OF GOVERNOR-GENERAL IN EMERGENCIES.

17. If at any time an emergency has arisen in which it is expedient that the Commonwealth Government should have control over the transmission of all messages by wireless telegraphy, the Governor-General may by notice in the *Gazette* prohibit for such period as he thinks necessary the use of wireless telegraphy on board foreign ships in territorial waters.

CONTROL OF COMMUNICATIONS AND APPLIANCES IN EMERGENCIES.

18. (1) In case of emergency, the Naval Board or any officer in command of any ship of war of His Majesty's Navy (whether Imperial or Dominion), or any officer in command of any part of the Defence Force, may—

(*a*) take possession of any wireless telegraph appliances installed on any ship in pursuance of a license, and use such appliances for the King's service; or

(*b*) place any person in control of any such appliances; or

(*c*) direct the licensee or person in charge of such appliances to submit to him all or any messages tendered for transmission or received by means of such appliances; or

(*d*) stop or delay or direct the licensee or person in charge of such appliances to stop or delay the transmission or delivery of any such messages or to deliver them to him; or

(*e*) direct the licensee or person in charge of such appliances to comply with all such directions as he thinks fit to give with reference to the transmission or receipt of messages by means of such appliances.

(2) Every licensee and every person in charge of any wireless telegraphy appliances installed in pursuance of a license shall comply with this regulation, and all directions issued in pursuance thereof.

(3) Reasonable compensation shall be payable to the licensee for any damage to the appliances arising in consequence of the exercise of the powers conferred by this regulation.

(4) The Minister may notwithstanding anything contained in a license issued to a licensee under the Wireless Telegraphy Regulations 1916 by order published in the *Gazette*, prohibit for such time as he directs any licensee from communicating with any radiotelegraph station licensed by, or belonging to, or in any country which is at war with His Majesty the King or the possessions thereof.

(5) Any order under sub-regulation (4) of this regulation may prohibit all communications whatever, or may prohibit communications to particular stations or under special circumstances.

OPERATORS' PROFICIENCY CERTIFICATES.

19. (1) Every ship station in respect of which a license is issued must be operated by a person or persons holding a certificate of competency or certificates of competency issued by the Naval Board after examination, or by the Postmaster-General of the United Kingdom, or by the proper authority in any part of the British Empire.

(2) Certificates of competency shall only be issued to natural-born British subjects, both of whose parents are natural-born British subjects:

Provided that—

(*a*) a certificate of competency shall not be issued to any person who, or either of whose parents, has at any time been a subject of a country with which the United Kingdom is now at war; and

(*b*) in the case of a person who, or either of whose parents, has, at any time, been a subject, or a citizen, as the case may be, of a country which is an ally of Great Britain in the present war, or which has remained neutral during the present war, a certificate of competency may be issued or withheld by the Naval Board as the Naval Board determines according to the merits of the case.

(2A) Certificates of competency shall be of two classes, namely:—

(*a*) first class—issued to persons over eighteen years of age capable of receiving and transmitting by sound at a speed which must not be less than twenty words per minute; and

(*b*) second class—issued to persons over eighteen years of age capable of receiving and transmitting by sound at a speed which must not be less than twelve words per minute.

(3) A fee of Ten shillings shall be paid by the candidate on each occasion on which such candidate is examined. A certificate of competency may be issued at a charge of Five shillings to each candidate who satisfactorily passes the prescribed examination, and in the event of a certificate being lost a fee of Ten shillings shall be paid for the first copy of such certificate, One pound for the second copy, and Two pounds for any subsequent copies, provided that the Naval Board may authorise the issue of a duplicate or copy of a certificate without charge where it has been shown that the original certificate has been lost or destroyed in circumstances over which the holder had no control.

In case of failure a candidate shall not be re-examined in any system or under any circumstances until after the lapse of three months.

(4) If a person to whom a certificate of competency has been issued by the Naval Board—

(*a*) is convicted of a criminal offence; or

(*b*) is, on account of incompetence, or for any other reason, considered by the Naval Board to be unsuitable to continue to hold the certificate,

the Naval Board may withdraw, cancel, or suspend the certificate.

USE OF WIRELESS TELEGRAPHY FOR MILITARY PURPOSES.

20. These regulations shall not prevent the use, without license, by the military authorities of wireless telegraphy for military purposes. Provided that each wireless telegraphy installation (other than a mere temporary installation) to be used shall be authorised in writing by the Naval Board.

CHARGES.

21. The total charges for messages transmitted and received for any duly authorised Wireless Station within the Commonwealth or licensed under the Wireless Telegraphy Act 1905-1915 shall include:—

(*a*) the coast charge which belongs to the coast station;

(*b*) the ship charge which belongs to the ship station;

(*c*) the charge for transmission over the lines of the telegraph system (where necessary); and

(*d*) delivery charges (where necessary).

22. The rates for messages transmitted to or received from ship stations shall be as follows:—

(1) For ordinary messages—

(*a*) Coast station transmitting or receiving charge—

(i) Radiotelegrams to or from ships licensed in Australia or New Zealand, 3d. per word;

(ii) Radiotelegrams to or from other ships, 6d. per word.

(*b*) Ship station transmitting or receiving charge—

(i) Radiotelegrams to or from ships licensed in Australia or New Zealand, 2d. per word;

(ii) Radiotelegrams to or from other ships, not exceeding 4d. per word.

(*c*) Land line charge 1d. per word.

(2) For press messages—

(*a*) Coast station transmitting or receiving charge—

1½d. per word.

(*b*) Ship station transmitting or receiving charge—

Not exceeding 4d. per word, as determined by the ship authorities concerned;

(*c*) Land line charge, ½d. per word, odd fractions of one penny to be reckoned as one penny.

(3) For messages to or from ships of the British or Australian Navies—

(*a*) For official messages—

(i) There shall be no coast station charge.

(ii) There shall be no ship station charge.

(iii) Land line charge, 1d. per word.

(*b*) For private messages—

The rates and conditions shown in subregulation (1) of this regulation shall apply.

(4) For messages consisting of reports to Lloyd's agents concerning marine casualties and overdue vessels:—

(*a*) Coast station charge, 6d. per word.

(*b*) Land line charge, 1d. per word.

The charges for these messages shall be collected from the addressee.

(5) The charge for relaying radiotelegrams, irrespective of the number of coast stations concerned in the relaying, shall be:—

(*a*) When the ships of origin and of destination are both licensed in Australia or New Zealand, 4d. per word;

(*b*) When only one of the ships concerned or when neither of the ships concerned is licensed in Australia or New Zealand, 7d. per word.

23. (1) The rates for messages exchanged between stations established on the Australian mainland or in Tasmania and stations established on islands within the Commonwealth Administration or between any stations established on such islands except Flinders Island and King Island shall be—

(*a*) For ordinary messages one penny per word per radio station involved, plus ordinary land line charges for telegrams within the Commonwealth.

(*b*) For press messages (except Port Moresby and Samarai) (per station involved)—

	s.	d.
Not exceeding 25 words	1	3
Exceeding 25 but not exceeding 50 ..	2	6
Exceeding 50 but not exceeding 100..	5	0
Every additional 50 words or portion of 50 words	2	6

plus ordinary land line charges for press telegrams within the Commonwealth.

(*c*) For press messages to and from Port Moresby and Samarai (per station involved)—

	s.	d.
Not exceeding 25 words	0	7½
Exceeding 25 but not exceeding 50 words	1	3
Exceeding 50 but not exceeding 100 words	2	6
Every additional 50 words or portion of 50 words	1	3

plus ordinary land line charges for press messages within the Commonwealth.

(2) The rates for messages exchanged between stations established on the Australian mainland or in Tasmania and stations established on King and Flinders Islands shall be—

(*a*) For ordinary messages one halfpenny per word per radio station involved, with a minimum of One shilling per message plus ordinary land line charges for telegrams within the Commonwealth;

(*b*) For press messages (per station involved)—

	s.	d.
Not exceeding 25 words	0	7½
Exceeding 25 but not exceeding 50 words	1	3
Exceeding 50 but not exceeding 100 words	2	6
Every additional 50 words or portion of 50 words	1	3

plus ordinary land line charges for press telegrams within the Commonwealth.

(3) For messages exchanged between stations established on the Australian mainland or in Tasmania at times when the local telegraph offices are closed, the rates shall be 3d. per word plus the ordinary land line charges for telegrams within the Commonwealth, for such land line handling as is involved.

(4) For press messages exchanged between stations established on the Australian mainland or in Tasmania at times when the local telegraph offices are closed, the rates shall be 1d. per word plus the ordinary land line charges for press telegrams within the Commonwealth, for such land line handling as is involved.

(5) The rates for the radiotelegraphic transmission of deferred and week-end telegrams shall be one-half and one-quarter of the ordinary rates respectively.

(6) Delivery charges, if any, shall in all cases be paid by the addressee.

24. Repealed.

25. The total charge for messages transmitted to or from ships shall be paid by the sender.

Press Radiotelegrams for Publication on Ships.

26. (1) Press radiotelegrams for publication on ships shall be addressed to the commander of a ship, or to a newspaper published on board a ship, and shall bear in the address the words "for publication," which words shall be charged for at press rates.

(2) The information contained in such press radiotelegrams must either be published in a ship's newspaper or posted on a ship's public notice board.

(3) Press radiotelegrams shall, subject to this regulation, comply with the provisions of Articles 65 and 66 of the detailed regulations attached to the International Telegraph Convention.

Refunds.

27. The full charge for a radiotelegram will be refunded when such radiotelegram is rendered useless through a fault of the telegraph service, and the full charge, less land-line charges, will be refunded when a radiotelegram cannot be delivered on account of the ship of destination having passed out of range.

TRANSMISSION OF SHIPPING INTELLIGENCE BY TELEPHONE.

28. Information received at a coast station from vessels at sea, indicating the noon or midnight position, will be communicated by telephone to the owners or agents of such vessels on payment of One shilling per communication.

OCEAN FORECASTS AND WEATHER REPORTS.

29. Ocean forecasts sent by the Commonwealth Meteorologist will be transmitted from radiotelegraph stations owned, operated, and maintained by or on behalf of the Minister to vessels at sea and weather reports received at such radiotelegraph stations from vessels at sea, and addressed to the Commonwealth Meteorologist, will be transmitted on payment of the following charges :—

For each communication not exceeding 20 words, 2s.; for each additional word, 1d.; plus one penny per word land line charge.

REPEAL.

30. All regulations previously made under the Wireless Telegraphy Act 1905-1919, and in force at the commencement of these Regulations, are hereby repealed save as to any right, privilege, or obligation acquired, accrued, or incurred thereunder.

SHIP'S LICENSE.

FORM OF LICENSE.

C Dated 19
Commonwealth of Australia.
THE MINISTER FOR THE NAVY
to
....

LICENSE TO ESTABLISH A WIRELESS TELEGRAPH SHIP STATION.

To all to whom these presents shall come, I the Honourable
the Minister for the Navy of the Commonwealth of Australia
SEND GREETING:

Whereas
of
in the State of
(hereinafter called "the licensee") is desirous of establishing, erecting, maintaining and using on the called
belonging to the licensee appliances for the purpose of transmitting and receiving messages by means of wireless telegraphy :

And whereas by reason of the provisions of the Telegraph Acts 1863 to 1907 of the United Kingdom and the Wireless Telegraphy Order 1908 of the United Kingdom it is unlawful to establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any British ship (whether in the territorial waters of the British Islands or on the high seas) except under and in accordance with a license granted in that behalf by the Postmaster-General of that Kingdom :

Provided that a person on board a British ship which is registered in any British Possession (other than the Channel Islands and the Isle of Man) or in any British Protectorate, shall not be deemed to commit an offence against the Wireless Telegraphy Act 1904 of the United Kingdom by reason of the installation and working of wireless telegraphy on such ship if the authority in such Possession or Protectorate having power by law so to do shall have granted a license for the installation and working of apparatus for wireless telegraphy on that ship and if such person is acting in accordance with the provisions of such license :

And whereas the ship in respect of which this license is granted is registered in the Commonwealth :

And whereas by the Wireless Telegraphy Act 1905-1915 of the Commonwealth of Australia it is enacted that licenses to establish, erect, maintain and use stations and appliances for the purpose of transmitting or receiving messages by means of wireless telegraphy may be granted by the Minister for the Navy, for such terms and on such conditions and on payment of such fees as are prescribed :

And whereas the licensee has made application for this license and has paid the prescribed fee payable in respect thereof :

Now I,
the Minister for the Navy aforesaid, in pursuance of the Wireless Telegraphy Act 1905–1915, and in exercise of all powers and authorities enabling me in this behalf, do hereby grant to the licensee during the term or period commencing on the day of 19 , and terminating on the day of , 19 , license and permission—

(i) To establish, erect, and instal and maintain, work, and use for the purposes hereinafter mentioned at the ship station specified in the First Schedule hereto, appliances or apparatus for wireless telegraphy of the kind used in the system known as the
system of wireless telegraphy (which apparatus is hereinafter referred to as "the licensed apparatus").
Provided that—

(*a*) Each ship station shall be of such class mentioned in Article XIII of the Service Regulations annexed to the Radiotelegraph Convention 1912 as is specified in the said schedule opposite to the name of such station ;

(*b*) The apparatus installed shall be of the character specified in the said First Schedule ;

(*c*) A complete scheme of the connections intended to be employed shall be supplied by the licensee ;

(*d*) The transmitting apparatus used on each ship station shall be of such a character that the waves emitted are as pure and little damped as possible and the receiving apparatus used at the said station or stations shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals.

(*e*) The licensed apparatus shall be so constructed as to be capable of using wavelengths of 300 metres in length as measured by the standard of measurement in use by the Post Office in the United Kingdom for the time being and may have such other wavelengths not exceeding 600 metres in length as shall be authorised in writing from time to time by the Minister for the Navy ;

(*f*) The speed of transmission and reception of messages shall not in normal circumstances be less than twenty words a minute, five letters being counted as one word.

(ii) To transmit and receive messages by means of the licensed apparatus between the said ship station and coast stations and other ship stations. Provided that the transmission and receipt of messages from and at the said ship station when in any harbour in the British Islands shall be subject to such conditions ar

restrictions as the Postmaster-General of the United Kingdom may prescribe from time to time, and when in any harbour in the Commonwealth or any Territory under the control of the Commonwealth shall be subject to the Regulations under the Wireless Telegraphy Act 1905–1915; and

(iii) To receive money or other valuable consideration for or in respect of the use of the licensed apparatus, or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the First Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904 of the United Kingdom.

The term "telegraph" has the same meaning as in the Telegraph Act 1869 of the United Kingdom.

The expression "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station, and any other wireless telegraph station, whether a coast station or a ship station.

The expression "His Majesty's Navy" includes ships being part of the Naval Forces of any part of His Majesty's Dominions.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

The expressions "the International Telergaph Convention" and "the International Telegraph Regulations" mean respectively the International Convention of St. Petersburg, dated the 10th–22nd July, 1875, and the Service Regulations made thereunder, and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraphic Convention 1912" means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder, and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person, either on behalf or by permission of the licensee, for the transmission or receipt of messages except messages authorised by this license.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(2) Stations using wavelengths longer than those set apart for naval purposes shall not emit any subsidiary waves or harmonics likely to interfere with signalling or the commercial wavelengths or naval wavelengths in the vicinity.

(3) If the Admiralty or the Minister for the Navy is of opinion that the working of the licensed apparatus specified in the First Schedule hereto is inconsistent with the free use of naval signalling, the licensee shall when required in writing by the Minister for the Navy so to do, close the said station.

(4) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this license, the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the Wireless Telegraphy Act 1905–1915 so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraphic Convention 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister for the Navy from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not, without the consent of the Minister for the Navy, be altered or modified in respect of any of the particulars mentioned in the Schedules hereto.

9. The apparatus shall include such emergency installation as may be required according to the class of the ship station under the provisions of Article XI of the Service Regulations annexed to the Radiotelegraph Convention 1912.

10. The licensee shall at all times indemnify the Minister for the Navy against all actions, claims, and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act licensed or permitted by these presents.

11. (1) Subject to the provisions of this licence, the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference, whether as regards rates of charge, order of transmission, or otherwise. Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government or the Government of the Commonwealth the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

12. The licensee shall, so far as possible, receive from ships and light stations all requests for assistance and all signals of distress, and shall answer such requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

13. The licensed apparatus at the said ship station shall be worked only by a person or persons holding a certificate or certificates of

competency issued by the Minister for the Navy or by the Postmaster-General of the United Kingdom. Certificates of competency shall be granted only to persons who satisfy the Minister for the Navy that they possess the requisite technical proficiency as regards operating and knowledge of the regulations governing signalling, and shall be in such form and subject to such conditions as the Minister for the Navy shall from time to time prescribe.

14. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or the Government of the Commonwealth or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and transmitted by naval signalling or by any system of wireless telegraphy provided or maintained by or for the purposes of the Postmaster-General or any Department of His Majesty's Government or the Government of the Commonwealth, or by any licensee of the Minister for the Navy (other than the licensee).

15. The licensee shall keep full accounts records, and registers of all messages transmitted by means of the licensed apparatus, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister for the Navy shall from time to time reasonably require to be shown, messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms, written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraphic Convention 1912, and in default of any provisions on the subject in the said Convention for such period as is from time to time prescribed by the International Telegraph Regulations, and such registers and message papers shall be open to the inspection of the Minister for the Navy or his officers thereto authorised at the head office of the licensee in between the hours of 10 a.m. and 5 p.m. on every day, except Sunday or a Statute or general holiday.

16. The Minister for the Navy and any agent authorised in that behalf in writing by him may at all reasonable times enter upon the ship station hereby licensed for the purpose of inspecting, and may inspect any apparatus fixed or being in such station for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such station, and the working and use of such apparatus and telegraphic instruments.

17. The licensee shall carry on every ship at which a ship station is established under this licence a print or copy of the license certified under the hand of an appropriate officer of the Minister for the Navy to be a true copy, and also such documents as may be prescribed by the Minister for the Navy for the purpose of enabling the licensee to communicate with coast stations in accordance with the Radiotelegraphic Convention 1912.

18. (1) The licensee shall pay to the Minister for the Navy for and in respect of the license hereby granted a fee of One pound per annum.

(2) The fee payable under this license shall be payable before the issue of the license, and the fee payable upon the renewal of the license shall be payable before such renewal.

19. Except with the consent in writing of the Minister for the Navy, the licensee shall not assign, underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the license powers or authorities hereby granted.

20. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus, it shall be lawful for any officer in command of any ship of war of His Majesty's Navy to cause the licensed apparatus, or any part thereof, to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and subject thereto for such ordinary services as to the said officer may seem fit, and in that event any person authorised by the said officer may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid.

(2) Any such officer may in such event as aforesaid, instead of taking possession of the licensed apparatus as aforesaid, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus, either wholly or partly, and in such manner as he may direct, and such persons may enter upon any ship on which any apparatus is installed accordingly, or the said officer may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus, or any class or classes of such messages to stop or delay the transmission of any messages, or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said officer may prescribe, and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

21. In any of the following cases (that is to say) :—

(*a*) In case of any sum of money which ought to be paid by the licensee to the Minister for the Navy, under or by virtue of these presents, shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the covenants herein contained;

(*b*) In case of any breach, non-observance, or non-performance by or on the part of the licensee of any or the covenants (other than a covenant for the payment of money) or conditions herein contained, and on the part of the licensee to be observed and performed; or

(*c*) In case the licensee fails to comply with any regulation for the time being in force under the Wireless Telegraphy Act 1905–1915;

then and in any such case the Minister for the Navy may by notice in writing revoke and determine these presents, and the license, powers, and authorities hereinbefore granted, and thereupon these presents and the said license, powers, and authorities shall absolutely cease, determine, and become void but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Minister for the Navy under the covenants on the part of the licensee herein contained.

22. Nothing in these presents contained shall prejudice or affect the right of the Minister for the Navy from time to time to establish, extend,

maintain, and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Minister for the Navy from time to time to enter into agreements for or to grant licenses relative to the working and use of telegraphs (whether of a like nature to those hereby licensed or otherwise) or to the transmission of messages in any part of the Commonwealth or any Territory under the control of the Commonwealth by means of wireless telegraphy, or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Minister for the Navy by or under the Post and Telegraph Act 1901-1910 or the Wireless Telegraphy Act 1905-1915.

23. Any notice, request, or consent (whether expressed to be in writing or not) to be given by the Minister for the Navy under these presents may be under the hand of the Minister for the Navy or any Minister or officer authorised by the Minister for the Navy to act on his behalf, and may be served by sending the same in a registered letter addressed to the licensee at the usual or last-known place of residence or business of the licensee, and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Naval Secretary at his official address within the Commonwealth.

SCHEDULE I.

PARTICULARS OF THE SHIP STATION REFERRED TO IN THIS LICENSE.

Name of ship on which Station is established.	Class of ship under Radiotelegraphic Convention.	Nature of services performed.	Hours of service.	Normal Range of signalling in nautical miles. By night.	Normal Range of signalling in nautical miles. By day.	Character of apparatus. System of Radiotelegraphy and characteristics of the system of emission.	Character of apparatus. Wavelength in metres.	Power. Source and maximum output. Maximum to be taken by transmitting instruments.	If alternator is used. Number of cycles per second.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Other particulars :—

SCHEDULE II.

COMPLETE SCHEME OF CONNECTIONS AUTHORISED TO BE EMPLOYED IN THE HEREIN LICENSED STATION.

This drawing, which is purely diagrammatic, shows the circuits authorised to be employed in both the transmitter and receiver.

Signed, sealed, and delivered by the Minister for the Navy in the presence of (L.S.)

Signed, sealed, and delivered by the Licensee in the presence of (L.S.)

FORM OF RECEIVING LICENSE FOR AMATEURS.

D No.

Dated 19

COMMONWEALTH OF AUSTRALIA.

LICENSE TO TO USE WIRELESS TELEGRAPHY OR TELEPHONY FOR EXPERIMENTAL PURPOSES.

To all to whom these presents shall come, I the Honourable the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905–1919 send greeting.

Whereas
of
in the State of
(hereinafter called "the licensee") is desirous of establishing, erecting, maintaining, and using a system of wireless telegraphy or telephony as defined in section 2 of the Wireless Telegraphy Act 1905–1919 with the sole object of conducting demonstrations or experiments in wireless telegraphy or telephony. And whereas by reason of the provisions of the Post and Telegraph Act 1901–1916, and of the Wireless Telegraphy Act 1905–1919, it is unlawful to establish, erect, maintain, or use any station or appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy or telephony except under and in accordance with a license granted in that behalf by the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905–1919, and it is also unlawful, save as in the said Acts provided, to transmit telegrams or other

communications by telegraph within the Commonwealth of Australia:

And whereas the licensee has made application for this license;

Now I,

the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905–1919 aforesaid, in pursuance of the Wireless Telegraphy Act 1905–1919 and in exercise of all powers and authorities enabling me in this behalf, do hereby grant to the licensee from the date of these presents until these presents are determined as hereinafter provided licence and permission—

(i) To establish, erect, maintain, and use at the station specified in the first and second schedules hereto, appliances for the purpose only of *receiving* messages by means of wireless telegraphy or telephony (hereinafter called "the licensed appliances") provided that the appliances installed at the station shall be of the character specified in the said first and second schedules; and

(ii) To receive messages by means of wireless telegraphy or telephony at the said station from any experimental station provisionally authorised or fully licensed by the Minister.

Provided that the licensed appliances shall be worked and the messages shall be received solely for the purpose of conducting experiments in wireless telegraphy or telephony, and for no other purpose whatever.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the schedules hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction (that is to say):—

(1) The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1905–1919.

(2) The terms "telegraph" and "telegraph line" have the same meanings as in the Post and Telegraph Act 1901–1916.

(3) The expression "naval signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station, and any other wireless telegraph or telephone station, whether on shore or in any ship.

(4) The expression "His Majesty's Navy" or "His Majesty's ships" includes ships being part of the Naval Forces of any part of His Majesty's Dominions.

(5) The expression "Australia" includes the territorial waters of the Commonwealth of Australia and of any territory of the Commonwealth of Australia.

(6) The expression "military signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more sets of appliances for wireless telegraphy or telephony operated by or on behalf of the Military Forces of the Commonwealth of Australia or between one such set of appliances and any other wireless telegraph or telephone station.

(7) The expression "Minister" means the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905–1919.

2. The licensed appliances shall not be used by the licensee or any other person either on behalf or by permission of the licensee for the receipt of messages except messages authorised by this licence.

3. The licensee shall observe the provisions of any regulations from time to time made under the Wireless Telegraphy Act 1905–1919 so far as the same are applicable to the licensee.

4. (*a*) The licensed appliances shall not without the previous consent in writing of the Minister be altered in respect of any of the particulars mentioned in the first and second schedules hereto.

(*b*) The licensee shall at all times indemnify the Commonwealth of Australia and the Minister against all actions, claims, and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act licensed or permitted by these presents.

5. Neither the licensee nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Commonwealth of Australia or a competent legal tribunal), or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid and transmitted by naval or military signalling or by any system of wireless telegraphy or telephony provided or maintained by or for the purposes of the Minister or any Department of the Commonwealth of Australia or by any licensee of the Minister.

6. The licensee shall not deliver or cause to be delivered to any person any messages received by him by wireless telegraphy or telephony unless the transmission or delivery of such message has been approved by the Minister or by an officer duly authorised by him to approve thereof.

7. Officers of the Royal Australian Naval Radio Service and persons thereunto authorised by the Minister may from time to time and at all reasonable times enter upon the station or other premises in the possession or occupation of the licensee for the purpose of inspecting and may inspect any appliances fixed or being in such places respectively for the purpose of receiving messages by wireless telegraphy or telephony and all other telegraphic or telephonic instruments and appliances fixed or being in such stations respectively and the working and the user of such appliances and telegraphic or telephonic instruments respectively.

8. (*a*) All appliances used or intended to be used under this license shall be so established, erected, maintained, and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance working or user of any telegraph line of the Postmaster-General which may from time to time exist or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or use thereof.

(*b*) In case any telegraph line of the Postmaster-General shall be damaged or the efficient working or use thereof shall be wholly or partially interrupted or otherwise interfered with and the Chief Electrical Engineer for the time being of the Postmaster-General's Department shall certify in writing under his hand that such damage interruption or interference has been caused directly or indirectly by any appliances used under this license, or by anything done by on behalf or with the permission of the licensee in relation thereto, the licensee shall on demand

pay to the Postmaster-General all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraph lines so as to restore the same to efficient working order and in adding thereto or substituting therefor either temporarily or permanently any other telegraph line if the said Chief Electrical Engineer shall certify that such addition or substitution is reasonably required.

(*c*) For the purpose of this Article, the expression "telegraph line" has the same meaning as in the Post and Telegraph Act 1901–1916 and the expression "telegraph line of the Postmaster-General" includes a telegraph or telephone line belonging to or worked by the Postmaster-General or constructed or maintained by him for any Department of the Commonwealth of Australia or other body or person.

9. The licenses powers and authorities hereby granted shall not except with the previous consent in writing of the Minister be assigned transferred sub-let or otherwise disposed of or dealt with and the licensee shall not except with a like consent allow any other person or body to participate in any manner whatsoever in the benefits of such licenses powers or authorities.

10. (*a*) If and whenever, in the opinion of the Minister, an emergency shall have arisen in which it is expedient that His Majesty the King shall have control over the station or premises specified in the first and second schedules hereto and the appliances and instruments thereon it shall be lawful for the Minister to call upon the licensee to hand over to him on behalf of His Majesty the King such station premises appliances and instruments or any part or parts thereof and if the licensee shall comply with such demand the Minister or any person thereunto authorised by him may enter upon such station or premises and take possession of and use the same together with all appliances and instruments thereon.

(*b*) The Minister shall during the period the possession and use of the said station premises appliances and instruments are retained on behalf of His Majesty the King reimburse to the licensee all wages and salaries paid by the licensee to persons employed in connection with the said station or premises provided that the employment of such persons is necessary for the proper upkeep of the said station or premises and provided further that such wages or salaries are at the same rates as previously paid by the licensee for similar services.

(*c*) In the event of the licensee refusing to hand over on demand the said station or premises and the appliances and instruments thereon the Minister may immediately thereupon cancel this licence without prejudice to any steps the Governor-General in Council may think fit to take to obtain possession of such station premises appliances or instruments.

11. The technical details of the herein licensed station are contained in the first schedule hereto, and the complete scheme of connections authorised to be employed is shown in the second schedule hereto.

12. (*a*) The licensee shall pay to the Minister for and in respect of license hereby granted a fee of Two pounds (£2) for each year or part of a year the licence is in force in respect of the station at which the licensed apparatus is installed.

(*b*) The fee shall be payable to the Minister annually in advance.

13. The Minister may at any time in his absolute discretion give notice in writing to revoke and determine these presents and to cancel the licence or permission hereby given at the end of twenty-four hours from the time of service of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Minister under any covenant or provision herein contained on the part of the licensee to be observed and performed.

14. In the event of these presents and the licence or permission hereby given being revoked and determined by the Minister under the power hereinbefore contained or any other power hereunto enabling him the licensee shall not be entitled to any compensation or damages by reason of the determination.

15. Nothing in these presents contained shall prejudice or affect the right of the Commonwealth of Australia from time to time to establish erect extend maintain and use any system or systems of telegraphic or telephonic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as it shall in its discretion think fit neither shall anything herein contained prejudice or affect the right of the Commonwealth of Australia from time to

SCHEDULE I.

Names of Station.	Description of Receiving Apparatus.
(1)	(2)

SCHEDULE II.

Complete scheme of connections authorised to be employed in the herein licensed station.

This drawing, purely diagrammatic, shows the circuits authorised to be employed in the receiver.

Signed, sealed, and delivered by the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905–1919 in the presence of—

This license is accepted by me under the provisions and terms and on the conditions above set out.

Signed, sealed, and delivered by the said licensee in the presence of—

FORM OF TRANSMITTING AND RECEIVING LICENSE FOR AMATEURS.

No.

Dated 19

time to enter into agreements for or to grant licences relative to the working and user of telegraphs or telephones (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of Australia by means of wireless telegraphy or telephony or by any other means with or to any person or persons whomsoever upon such terms as it shall in its discretion think fit and (save as in this licence expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Post and Telegraph Act 1901–1912 or by the Minister under the Wireless Telegraphy Act 1905-1919.

16. Any notice request or consent (whether expressed to be in writing or not) to be given by or for the Minister under these presents may be under the hand of the Secretary for the time being to the Department being administered by the Minister and may be served by sending the same by registered letter addressed to the licensee at the usual or last known place of residence or business of the licensee and in such case the time of service shall be deemed to mean the time when in the ordinary course of post it would have been delivered to the licensee at such place and any notice to be given by the licensee under these presents may be served by sending the same by registered letter addressed to such secretary at his official address within the Commonwealth.

In witness whereof the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905–1919 has hereunto set his hand and seal the day and year first hereinbefore written.

COMMONWEALTH OF AUSTRALIA.

E License to Use Wireless Telegraphy or Telephony for Experimental and Instructional Purposes.

To all to whom these presents shall come, I, the Honourable

the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905–19 send greeting:

Whereas

of

in the State of

(hereinafter called "the licensee"), is desirous of establishing, erecting, maintaining, and using a system of wireless telegraphy or telephony as defined in section 2 of the Wireless Telegraphy Act 1905–1919, with the sole object of conducting demonstrations or experiments in wireless telegraphy or telephony: And whereas by reason of the provisions of the Post and Telegraph Act 1901–1916 and of the Wireless Telegraphy Act 1905–1919 it is unlawful to establish, erect, maintain, or use any station or appliance for the purpose of transmitting or receiving messages by means of wireless telegraphy or telephony except under and in accordance with a license granted in that behalf by the Minister or member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905–1919, and it is also unlawful, save as in the said Acts provided, to transmit telegrams or other communications by telegraph within the Commonwealth of Australia:

And whereas the licensee has made application for this license:

Now I,

the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905–1919 aforesaid, in pursuance of the Wireless Telegraphy Act 1905–1919, and in exercise of all powers and authorities enabling me in this behalf, do hereby grant to the licensee from the date of these presents until these presents are determined as hereinafter provided, licence and permission—

(i) To establish, erect, maintain, and use at the station specified in the first and second schedules hereto appliances for the purpose of *transmitting and receiving messages* by means of wireless telegraphy or telephony (hereinafter called "the licensed appliances"), provided that the appliances installed at the station shall be of the character specified in the said first and second schedules, and operated in accordance with the conditions specified.

Provided that the licensed appliances shall be worked and the messages shall be transmitted and received solely for the purpose of conducting demonstrations in wireless telegraphy or telephony at public lectures or conducting experiments in wireless telegraphy or telephony for the advancement of science and for no other purpose whatever.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions, which may be altered, added to, or modified hereafter to meet public interests or requirements or emergencies.

1. In these presents (and in the schedules hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction (that is to say):—

(1) The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1905 1919.

(2) The terms "telegraph" and "telegraph line" have the same meaning as in the Post and Telegraph Act 1901-1916.

(3) The expression "naval signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph or telephone station, whether on shore or on any ship.

(4) The expression "His Majesty's Navy" or "His Majesty's ships" includes ships being part of the Naval Forces of any part of His Majesty's Dominions.

(5) The expression "Australia" includes the territorial waters of the Commonwealth of Australia and of any territory of the Commonwealth of Australia.

(6) The expression "military signalling" means signalling by means of any system of wireless telegraphy or telephony between two or more sets of appliances for wireless telegraphy or telephony operated by or on behalf of the Military Forces of the Commonwealth of Australia, or between one such set of appliances and any other wireless telegraph or telephone station.

(7) The expression "Minister" means the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919.

2. The licensed appliances shall not be used by the licensee or any other person either on behalf or by permission of the licensee for the transmission or receipt of messages except messages authorised by this license.

3. The licensee shall observe the provisions of any regulations from time to time made under the Wireless Telegraphy Act 1905–1919 so far as the same are applicable to the licensee.

4. (*a*) The licensed appliances shall be so worked as not to interfere with the working of any wireless telegraph or telephone station established in Australia by or for the purposes of the Minister for the Navy or any Department of the Commonwealth of Australia, or for commercial purposes, and in particular with the transmission or receipt of any messages between or at wireless telegraph or telephone stations established as aforesaid on land and wireless telegraph or telephone stations established on ships at sea. On no account shall His Majesty's ships be called by means of the licensed appliances.

(*b*) With a view to preventing such interference as aforesaid the licensee and every person acting on his behalf or by his permission shall comply with all directions which shall be given to the licensee by the Minister or prescribed by the Minister with respect to avoiding interference between one wireless telegraph or telephone station and another.

(*c*) The licensed appliances shall not without permission, in writing, from the Minister, or an officer thereunto authorised by him, be altered in respect of any of the particulars mentioned in the first and second schedules hereto.

(*d*) The licensee shall at all times indemnify the Commonwealth of Australia and the Minister against all actions, claims, and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act licensed or permitted by these presents.

5. (*a*) The licensee shall not (either by himself or by any person acting on his behalf or by his permission), by the transmission of any message by means of the licensed appliances or otherwise by the use of the licensed appliances, interfere with naval or military signalling.

(*b*) Whenever the operators of the said station of the licensee perceive, through the medium of the appliances used by them, that naval or military signalling is proceeding, they shall refrain from using the licensed appliances until all indication that naval or military signalling is proceeding shall have ceased.

(*c*) These provisions for the protection of naval or military signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

6. Neither the licensee nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Commonwealth of Australia or a competent legal tribunal), or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid, and transmitted by naval or military signalling or by any system of wireless telegraphy or telephony provided or maintained by or for the purposes of the Minister for Navy or any Department of the Commonwealth of Australia or by any licensee of the Minister other than the licensee.

7. Officers of the Royal Australian Naval Radio Service and persons thereunto authorised by the Minister may from time to time and at all reasonable times enter upon the station or other premises in the possession or occupation of the licensee, for the purpose of inspecting, and may inspect any appliances fixed or being in such places respectively for the purpose of sending and receiving messages by wireless telegraphy or telephony and all other telegraphic or telephonic instruments and appliances fixed or being in such stations respectively and the working and the user of such appliances and telegraphic or telephonic instruments respectively.

8. (*a*) All appliances used or intended to be used under the license shall be so established, erected, maintained, and used as not either directly, or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working, or user of any telegraph line of the Postmaster-General which may from time to time exist, or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or use thereof.

(*b*) In case any telegraph line of the Postmaster-General shall be damaged or the efficient working or use thereof shall be wholly or partially interrupted or otherwise interfered with, and the Chief Electrical Engineer for the time being of the Postmaster-General's Department shall certify in writing under his hand that such damage, interruption, or interference has been caused directly or indirectly by any appliances used under this license, or by anything done by or on behalf or with the permission of the licensee in relation thereto, the licensee shall on demand pay to the Postmaster-General all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraph lines so as to restore the same to efficient working order, and in adding thereto or substituting therefor either temporarily or permanently any other telegraph line, if the said Chief Electrical Engineer shall certify that such addition or substitution is reasonably required.

(*c*) For the purpose of this Article, the expression "telegraph line" has the same meaning as in the Post and Telegraph Act 1901—1916, and the expression "telegraph line of the Postmaster-General" includes a telegraph or telephone line belonging to or worked by the Postmaster-General or constructed or maintained by him for any Department of the Commonwealth of Australia or other body or person.

9. Except with the consent in writing of the Minister the licensee shall not assign, underlet, or otherwise dispose of or admit any other person or body to participate in the benefits of the licences, powers, or authorities hereby granted or any of such licenses, powers, or authorities.

10. (*a*) If and whenever, in the opinion of the Minister, an emergency shall have arisen in which it is expedient that His Majesty the King shall have control over the transmission and receipt of messages by the licensed appliances, it shall be lawful for the Minister to call upon the licensee to hand over to him on behalf of His Majesty the King so much of the licensed appliances as is within Australia, or any part thereof, and if the said licensee shall comply with the demand the Minister or any person authorised by him may enter upon and take possession of the station specified in the first and second schedules and use the same together with all appliances and instruments thereon.

(*b*) The Minister shall, during the period the possession and use of the said station, appliances, and instruments are retained on behalf of His Majesty the King, reimburse to the licensee all wages and salaries paid by the licensee to persons employed in connection with the said station, provided that the employment of such persons is necessary for the proper upkeep of the said station, and provided further that such wages or salaries are at the same rates as previously paid by the licensee for similar services.

(*c*) In the event of the licensee refusing to hand over the said station and appliances on demand, the Minister may immediately there-

upon cancel this license without prejudice to any steps the Governor-General in Council may think fit to take to obtain possession of the said station and appliances.

11. The technical details of the herein licensed station are contained in the first schedule hereto; and the complete scheme of connections authorised to be employed is shown in the second schedule hereto.

12. (1) The licensee shall pay to the Minister for and in respect of the license hereby granted a fee of Two pounds (£2) for each year or part of a year the license is in force in respect of the station at which the licensed apparatus is installed.

(2) The fee shall be payable to the Minister annually in advance.

13. The Minister may at any time in his absolute discretion by notice in writing revoke and determine these presents and cancel the license or permission hereby given at the end of twenty-four hours from the time of service of such notice, and at the expiration of that period the licence or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any covenant or provision herein contained on the part of the licensee to be observed and performed.

14. In the event of these presents and the license or permission hereby given being revoked and determined by the Minister under the power hereinbefore contained or any other power thereunto enabling him, the licensee shall not be entitled to any compensation or damages by reason of the determination.

15. Nothing in these presents contained shall prejudice or affect the right of the Commonwealth of Australia from time to time to establish, erect, extend, maintain, and use any system or systems of telegraphic or telephonic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as it shall in its discretion think fit, neither shall anything herein contained prejudice or affect the right of the Commonwealth of Australia from time to time to enter into agreements for or to grant licences relative to the working and user of telegraphs or telephones (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of Australia by means of wireless telegraphy or telephony or by any other means with or to any person or persons whomsoever, upon such terms as it shall

SCHEDULE I.

CHARACTER OF APPLIANCES.

Name of Licensee and Address of Station.	Description of Transmitting Appliances.	Description of Receiving Appliances.	Wavelength to be employed in Transmitter.	Maximum Watt energy permitted to be employed in Transmitter.
1.	2.	3.	4.	5.

Type of aerial, height, construction	
Nature and voltage of primary power ..	
Transformer; ratio of windings	
Spark gap	
Particulars of transmitting oscillator	
Condenser—Capacity of	
Form of coupling	
Details of earth connections	

SCHEDULE II.

Complete scheme of connections and aerial system authorised to be employed in the herein licensed station.

This drawing, purely diagrammatic, shows the circuits authorised to be employed in both the transmitter and receiver.

Signed, sealed, and delivered by the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905–1919 in the presence of—

This license is accepted by me under the provisions and terms and on the conditions above set out.

Signed, sealed, and delivered by the said licensee in the presence of—

in its discretion think fit, and (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Post and Telegraph Act 1901-1916 or by the Minister by or under the Wireless Telegraphy Act 1905-1919.

16. Any notice, request, or consent (whether expressed to be in writing or not) to be given or made by or for the Minister under these presents may be under the hand of the Secretary for the time being of the Department being administered by the Minister, and may be served by sending the same by registered letter addressed to the licensee at the usual or last-known place of residence or business of the licensee, and in such case the time of service shall be deemed to mean the time when in the ordinary course of post it would have been delivered to the licensee at such place; and any notice to be given by the licensee under these presents may be served by sending the same by registered letter addressed to such secretary at his official address within the Commonwealth of Australia.

17. The licensee may communicate with any experimental radiotelegraph station provisionally authorised or fully licensed by the Minister for experimental purposes, providing that such communication does not interfere with the conduct of W/T signalling.

In witness whereof the Minister or Member of the Executive Council for the time being administering the Wireless Telegraphy Act 1905-1919 has hereunto set his hand and seal the day and year first hereinbefore written.

NAVIGATION ACT.

The Commonwealth Parliament passed in 1912 a Navigation Act which contains a clause making it compulsory for ships trading in Australian waters to be equipped with apparatus for wireless telegraphy. This matter is dealt with in section 231 of the Act, and the text of the section given below is as under :—

EXTRACT FROM NAVIGATION ACT, 1912.

Division VI.

231. (1) Except as prescribed, every foreign-going ship, Australian trade ship, or ship engaged in the coasting trade, carrying fifty or more persons, including passengers and crew, shall before going to sea from any port in Australia be equipped with an efficient apparatus for wireless communication in good working order in charge of one or more persons holding prescribed certificates of skill in the use of such apparatus.

(2) For the purposes of this section apparatus or wireless communication shall not be deemed to be efficient unless :

(*a*) It is capable of transmitting and receiving messages over a distance of at least 100 miles, day and night.

(*b*) The person controlling the operator undertakes in writing to the Minister to exchange, and does, in fact, exchange, as far as may be physically practicable (of which the master shall be the judge) messages with shore or ship stations using similar or other systems of wireless communication; and

(*c*) There is provided, in connection with the apparatus, and ready for use whenever from any cause the ordinary supply of electrical power is not available, a battery of accumulators of such capacity as to insure for a period of at least six hours communication of the efficiency prescribed in paragraph (*a*) of this sub-section.

(3) The equipment shall, if so prescribed, include a silent chamber for the receipt of messages.

(4) The master of a ship required by this section or the regulations to be equipped with wireless telegraphy apparatus shall not take her to sea, and the owner of a ship required to be so equipped shall not permit her to go to sea, unless the requirements of this section have been complied with.

Penalty : One Thousand Pounds.

(5) The regulations may prescribe the times and hours during which an operator shall be in attendance on the apparatus, ready to receive or transmit messages.

(6) Except as otherwise prescribed, the provisions of this section shall not apply to ships plying exclusively between ports in Australia less than two hundred miles apart.

(7) The Governor-General may make regulations in accordance with the provisions of any International Convention to which the United Kingdom is a party relating to the use of wireless telegraphy on ships, and such regulations may be in addition to, or in substitution either wholly or in part for the provisions of this section.

STATUTORY RULES.

1921. No. 104.

Regulations under the Navigation Act, 1912-1920.

I, the Governor-General, in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Navigation Act, 1912-1920, to come into operation on and from the first day of October, 1921.

Dated this twelfth day of May, 1921.

Forster,
Governor-General.

By His Excellency's Command,
W. Massy Greene,
Minister of State for Trade and Customs.

Navigation (Wireless Telegraphy) Regulations.

1. These Regulations may be cited as the Navigation (Wireless Telegraphy) Regulations, 1921.

2. In these Regulations, unless the contrary intention appears—

"Automatic Apparatus" means an automatic apparatus approved by the Board of Trade of the United Kingdom;

"On Watch" means on watch in the wireless telegraph room of the ship;

"Signal of Distress" means the wireless distress call as specified in Schedule IV to the Act; and

"The Act" means the Navigation Act, 1912-1920.

3. (1) Subject to the next succeeding subregulation, these Regulations shall apply to ships (British and foreign) of the classes enumerated in the next succeeding Regulation which—

(*a*) Carry more than twelve passengers; or

(*b*) Are of sixteen hundred tons gross registered tonnage or upwards.

(2) These Regulations shall not apply to—

(*a*) River and bay ships;

(*b*) Limited coast-trade ships which do not trade beyond 100 nautical miles from principal port of departure; or

(*c*) Ships not registered in Australia (other than British ships regularly employed in trading from a port in the Commonwealth) unless they take on board, at a port in the Commonwealth, passengers to be conveyed to another port, within or without the Commonwealth.

4. (1) For the purposes of these Regulations ships shall be classified as follows:—

Class I.—Australian trade and foreign-going ships carrying 200 or more persons.

Class II.—(*a*) Australian-trade and foreign going ships carrying 50 but less than 200 persons; and

(*b*) Limited coast-trade ships carrying 50 or more persons; and

Class III.—Ships carrying less than 50 persons.

(2) In computing, for the purposes of this Regulation, the number of persons carried by a ship, there shall be included the normal crew of the ship and the maximum number of passengers provided for in the passenger certificate (if any) of the ship.

5. Those ships only to which these Regulations apply shall be ships which are required to be provided with a wireless telegraph installation, to maintain a wireless telegraph service and to be provided with cerificated operators and watchers in accordance with section 231 of the Act.

6. (1) The wireless telegraph installation with which ships are to be provided in accordance with section 231 of the Act shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention for the Safety of Life at Sea, 1914), or of any international agreement superseding the International Radiotelegraph Convention, 1912.

(2) In the event of an automatic apparatus for registering the signal of distress being approved by the Board of Trade of the United Kingdom, a ship of Class III shall be provided, in addition, with such an apparatus unless the normal duration of the voyage of the ship from one port of call to the next does not exceed eight hours.

7. The installation shall be of the spark or interrupted continuous wave type.

8. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this Regulation as to emergency installations as well as the requirements as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting, by day, under normal conditions and circumstances, clearly perceptible signals from ship to ship over a range of at least 100 nautical miles.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and the independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this Regulation an installation shall be deemed to comply with the requirements of this Regulation as to range if it is able to maintain, over sea, by day, with a Post Office Standard Station when employing a receiver without amplification devices, communication on a 600-metre wave at a range of one and a half times the number of nautical miles respectively prescribed by this Regulation.

9. There shall be provided, between the bridge and the wireless telegraph room, means of communication by voice pipe, telephone or other means approved by the Director of Navigation, and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

10. If not fitted with an automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while the ship is at sea a certificated operator shall be always on watch:—

NATURE OF VOYAGE.	NUMBER AND GRADE OF OPERATORS.
(*a*) Voyage exceeding 48 hours from port to port.	Three operators, of whom one shall hold a First Grade Certificate, and not more than one a Third Grade Certificate.
(*b*) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	Two operators, of whom one shall hold a First or a Second Grade Certificate.
(*c*) Voyage not exceeding 8 hours from port to port.	One operator, who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while the ship is at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Regulations, and either a certificated operator or a certificated watcher shall always be on watch at other times:—

NATURE OF VOYAGE.	NUMBER AND GRADE OF OPERATORS.
(*a*) Voyage exceeding 48 hours from port to port.	One operator, who shall hold a First or a Second Grade Certificate, and two watchers
(*b*) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	One operator, who shall hold a First or a Second Grade Certificate, and one watcher.
(*c*) Voyage not exceeding 8 hours from port to port.	One operator, who shall hold a First or a Second Grade Certi)-cate.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade Certificate, and while the ship is at sea the operator shall always be on watch at the times specified in the Schedule to these Regulations:

Provided that if the duration of the voyage on which the ship is employed does not exceed eight hours from port to port the operator shall be on watch during the whole time of the voyage.

11. If fitted with an automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while the ship is at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Regulations, and a watch shall be maintained in the wireless

telegraph room on the ship at all other times either by a certificated operator, or by a watcher, or by means of the automatic apparatus :—

NATURE OF VOYAGE.	NUMBER AND GRADE OF OPERATORS.
(*a*) Voyage exceeding 48 hours from port to port.	Two operators, one of whom shall hold a First Grade Certificate.
(*b*) Voyage not exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II or III shall carry one operator, who shall hold a First or a Second Grade Certificate, and while the ship is at sea the operator shall be on watch during the times specified in the Schedule to these Regulations, and a watch shall be maintained in the wireless telegraph room on the ship at all other times either by an operator, or by a watcher, or by means of the automatic apparatus :

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Regulations.

12. For the purposes of the last two preceding Regulations, the number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

13. (1) For the purposes of these Regulations :

(*a*) An operator shall be deemed to hold a First Grade Certificate if he holds a First Class Certificate of Proficiency issued by the Postmaster-General under the Wireless Telegraphy Regulations, 1920 (being Statutory Rules, 1920, No. 256) made under the Wireless Telegraph Act, 1905-1919, and has had at least three years' experience as an operator ;

(*b*) An operator shall be deemed to hold a Second Grade Certificate if he holds a

SCHEDULE.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

Zones.	Western Limit.	Eastern Limit.	Times of Watch for One Operator, Greenwich Mean Time.*	Times of Watch for Two Operators, Greenwich Mean Time.*
A. Eastern Atlantic, Mediterranean, North Sea, Baltic, Western Arctic Sea	Meridian of 30° W.; Coast of Greenland	Meridian of 30° E. to the South of the Coast of Africa ; Eastern limit of Mediterranean, Black Sea, and of the Baltic ; 30° E. to the North of Coast of Norway	from 8 h. to 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.
B. Indian Ocean, Eastern Arctic Sea	Eastern Limit of Zone A	Meridian of 90° E. .. .	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 24 h.
C. China Sea, Western Pacific Ocean	Eastern Limit of Zone B	Meridian of 160° E.	from 0 h. to 2 h. 4 h. „ 6 h. 12 h. „ 14 h. 20 h. „ 22 h.	from 0 h. to 6 h. 8 h. „ 10 h. 12 h. „ 14 h. 16 h. „ 22 h.
D. Central Pacific Ocean	Eastern Limit of Zone C	Meridian of 140° W.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 8 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 24 h.
E. Eastern Pacific Ocean	Eastern Limit of Zone D	Meridian of 70° W. to the South of the Coast of America; West Coast of America.	from 0 h. to 2 h. 4 h. „ 6 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 6 h. 6 h. „ 14 h. 16 h. „ 22 h.
F. Western Atlantic Ocean and Gulf of Mexico	Meridian of 70° W. to the South of the Coast of America ; East Coast of America	Meridian of 30° W.; Coast of Greenland.	from 0 h. to 2 h. 12 h. „ 14 h. 16 h. „ 18 h. 20 h. „ 22 h.	from 0 h. to 2 h. 4 h. „ 10 h. 12 h. „ 18 h. 20 h. „ 22 h.

* NOTE.—Following the practice adopted in the Merchant Shipping (Wireless Telegraphy) Rules, 1920, issued by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act, 1919, Greenwich Mean Time is, for the purposes of this Schedule, reckoned from *midnight*, and not from midday.

First or Second Class Certificate of Proficiency so issued by the Postmaster-General, and has at least one year's experience as an operator;

(c) An operator shall be deemed to hold a Third Grade Certificate if he holds a First or Second Class Certificate of Proficiency so issued by the Postmaster-General, and has had less than one year's experience as an operator; and

(d) A watcher means a watcher certificated by the Postmaster-General, or by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the Regulations annexed to any International Radiotelegraph Convention for the time being in force.

(2) First, Second or Third Grade Certificates, or equivalent certificates, granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the Regulations annexed to any International Radiotelegraph Convention for the time being in force, shall be accepted as First, Second or Third Grade Certificates within the meaning of these Regulations.

STATUTORY RULES.

1921. No. 127.

Regulations under the Wireless Telegraphy Act, 1905-1919.

I, the Governor-General in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulation under the Wireless Telegraphy Act, 1905-1919, to come into operation forthwith.

Dated this seventh day of July, 1921.

Forster,
Governor-General.

By His Excellency's Command,
Geo. H. Wise,
Postmaster-General.

Amendment of the Wireless Telegraphy Regulations, 1920.
(Statutory Rules, 1920, No. 256.)

After Regulation 5 of the Wireless Telegraphy Regulations, 1920, the following Regulation is inserted:—

Provision as to Secrecy.

5a. Notwithstanding anything contained in any experimental or instructional license granted prior to the making of this Regulation, neither the licensee under an experimental or instructional license nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Commonwealth of Australia or a competent legal tribunal), or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid by means of the apparatus licensed by such license.

STATUTORY RULES.

1921. No. 132.

Regulations under the Navigation Act, 1912-1920.

I, the Governor-General in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Navigation Act, 1912-1920, to come into operation on and from the first day of October, 1921.

Dated this fourteenth day of July, 1921.

Forster,
Governor-General.

By His Excellency's Command,
W. Massy Greene,
Minister of State for Trade and Customs.

Amendment of Navigation (Wireless Telegraphy) Regulations.
(Statutory Rules, 1921, No. 104.)

Regulation 4 of the Navigation (Wireless Telegraphy) Regulations is amended by inserting at the end of sub-regulation (1) the following proviso:—

"Provided that, until the first day of October, One thousand nine hundred and twenty-two, all Australian-trade and limited coast-trade ships to which these Regulations apply shall be deemed to be classified in Class III."

STATUTORY RULES.

1921, No. 179.

Regulations under the Navigation Act, 1912—1920.
(Second Amendment, 1921).

I, The Governor-General in and over the Commonwealth of Australia, acting with the advice of the Federal Executive Council, hereby make the following Regulations under the Navigation Act, 1912-1920, to come into operation on and from the first day of October, 1921.

Dated this fourteenth day of September, 1921.

Forster,
Governor-General.

By His Excellency's Command,
W. Massy Greene,
Minister of State for Trade and Customs.

Amendment of Navigation (Wireless Telegraphy) Regulations. (Statutory Rules, 1921, No. 104.)

The Navigation (Wireless Telegraphy) Regulations 1921 are amended:—

(a) By inserting at the end of paragraph (b) of sub-regulation (1) of regulation 13 the following proviso:—

"Provided that, where it is shown to the satisfaction of the Director of Navigation that a sufficiency of operators holding First or Second Class Certificates of Proficiency issued by the Postmaster-General and having at least one year's experience as an operator are not available in the Commonwealth, he may to the extent of the deficiency in number of such operators, by writing under his hand, permit of the employment, as Second Grade Operators, of persons holding First or Second Class Certificates of Proficiency but with less than one year's experience as operators, and such persons so employed shall be deemed to be Second Grade Operators for the purposes of these Regulations"; and

(b) By inserting at the end of the Schedule thereto the following proviso:—

"Provided that, until otherwise prescribed, the time of watch for operators on Australian trade and limited coast-trade ships to which these Regulations apply may, in lieu of those set out in the schedule, and at the option of the owner, be in accordance with the provisions of the agreement between the Commonwealth Steamship Owners' Association and others of the one part and the Radio-Telegraphists' (Marine) Institute of Australasia of the other part, dated the 29th March, 1920, certified in the Commonwealth Court of Conciliation and Arbitration on 22nd September, 1902."

AUSTRIA

THE republic of German-Austria forms only a very small part of the erstwhile Austro-Hungarian Monarchy, being bounded on the north by Czecho-Slovakia and Germany; on the east by Czecho-Slovakia and Hungary; on the south by Jugo Slavia and Italy; and on the west by Switzerland.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. Konrad Hoheisel ..	Director-General of Posts and Telegraphs ..	Vienna.
Sektionschef Emil Fodrich	Chief of Section VII for Telegraphs, Telephones and Pneumatic Postal Affairs, Public Department of Communications	Vienna, A. Borseplatz 1.
Ministerial Councillor Friedrich Teufenstein.	Chief of the Telegraph Department	Vienna.

ORGANISATION.

In Deutsch-Altenburg a 25 kw. transmitting installation was erected in the year 1915, and was instituted as a temporary station for general working. Further, there was available as a reserve a 5 T V installation. As a permanent station the building of a 45 kw. transmitting station in Deutsch-Altenburg was completed in August, 1919, and it started working at that date. The 5 T V station still continues in existence as a reserve station.

At present the Austrian Telegraph Administration possesses a long distance radio station in Deutsch-Altenburg and also one at Laaerberg. The latter is on the Poulsen System. There is also at Laaerberg a receiving



station with Braun frame receivers. These stations are all under the control of Section VII of the Public Department of Communications.

In addition to the above the erection of radio stations at Graz, Lintz, Salzburg, Klagenfurt, Innsbruck and Bregenz is contemplated so that a land radio service may be maintained in Austria.

For the forwarding of correspondence only the radio installations of the State Administration are used in Austria. The other installations, for which concessions have been granted, serve either for experimental purposes or for the testing of radio installations of private firms.

ADMINISTRATION.

The issue of regulations relative to wireless telegraphy in connection with aviation, time, weather, and meteorological reports is under consideration. It is understood that these rules are in preparation, but so far it has not been possible to obtain copies.

The following decree regulates the administration of wireless telegraphy in the Republic :—

A—Decree of Ministry of Commerce, 7th January, 1910.

A The following Decree of the Ministry of Commerce, dated January 7th, 1910, is concerned with wireless telegraph stations in the Austrian Empire, on board Austrian ships, and on ships of foreign nationality in Austrian territorial waters :—

(1) In accordance with a High Decree of Parliament of January 16th, 1847, and the Decree of the Ministry of Commerce, dated April 28th, 1905, the erection and working of Wireless Telegraph stations in the Austrian Empire and on Austrian ships is a State concession to acquire which a written application (liable to Stamp Duty) containing a description of the station and a diagram of connections, must be submitted.

(2) The choice of system, apparatus, and fixtures, as well as the establishment of coast and land rates within the limits of the Wireless Telegraph Agreement of 1909, and the supplemental regulations are the prerogative of the Ministry of Commerce.

(3) The general regulations for Wireless Telegraph stations on board ships are shown below.

(4) Wireless Telegraph stations on board ships must fulfil the following conditions :—

(*a*) They must be of equal technical efficiency to systems other than that adopted in the stations, and they must be able to inter-communicate with other systems.

(*b*) The system adopted must be one of "syntonisation."

(*c*) The speed of transmission and reception must not, under normal circumstances, be less than twelve words (each of five letters) per minute.

(*d*) The power possessed by the apparatus must not exceed, in normal conditions, 1 kilowatt. A greater power can be used when the ship is under an obligation to exchange messages at a longer distance than 300 kilometres from the nearest coast station, or when the transmission can only be effected by means of a higher power than specified.

(5) The working of Wireless Telegraph stations on board foreign ships in Austrian territorial waters is dependent upon the previous grant of a State concession. This regulation does not apply to warships or ships in distress. If a foreign vessel employs its Wireless Telegraph station without authorisation, the State authorities may take steps to prevent the working of the station in Austrian territorial waters.

AZORES

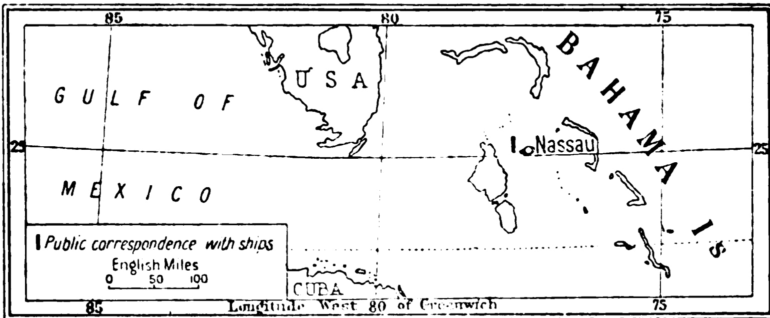
(See PORTUGAL.)

BAHAMA ISLANDS

THE Bahamas (or Lucayos) are an archipelago of the British West Indies, lying between 21° 42′-27° 34′ N. lat. and 72° 40′-79° 5′ W. long., and extending from the coast of Florida on the north-west to Haiti on the south-east.

CONTROL AND ORGANISATION.

There is but one radio station in the Colony, and that has been located in Nassau, New Providence. It was installed on August 28th, 1913, is owned by the Colony, and controlled under the authority of the Governor in Council. It is operated by the Telegraph Department.



Eleuthera Island (N. of Nassu) open for public general correspondence.

Official Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
P. H. Burn	Superintendent and Electrical Engineer ..	Nassau.

ADMINISTRATION.

The Radiotelegraph Act, 1913, regulates the administration of wireless telegraphy.

A—Radiotelegraphic Act, 1913.
B—Rules made thereunder.

3 and 4 George V, Chapter 7.

An Act

For establishing Radiotelegraphic Communication in the Colony and between the Colony and parts beyond the Limits of the Colony.

(Assented to 7th July, 1913.)

A May it please the King's Most Excellent Majesty that it may be enacted and be it enacted by His Excellency George Basil Haddon-Smith, Esquire, Companion of the Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief in and over the Bahama Islands, the Legislative Council and Assembly of the said Islands, and it is hereby enacted and ordained by the authority of the same as follows :—

1. This Act may be cited as the Radio-Telegraph Act, 1913, and together with "the Telegraph Act, 1891" and the Acts amending the same, may be cited as the Telegraph Acts, 1891 to 1913.

2. In this Act unless the context otherwise requires :—

"Rules" means Rules made under this Act.

"Superintendent" means the Superintendent of Telegraphs and Electrical Engineer.

3. (1) It shall be lawful for the Governor in Council—

(*a*) To make all necessary arrangements for securing, establishing and maintaining a radiotelegraph station in New Providence for radiotelegraphic communication between New Providence and other parts of the Colony and parts beyond the limits of the Colony and for such purpose to make and enter into any contract as may be requisite: The contract entered into on the 3rd day of December, 1912, between the Crown Agents for the Colonies acting for and on behalf of the Government of the Colony, and the Anglo-French Wireless Telegraph Company, Ltd., shall be deemed to be a contract entered into under the provisions of this Act.

(*b*) With any funds that may hereafter from time to time be specifically granted by the Legislature for the purpose to make all necessary arrangements for securing, establishing and maintaining a radiotelegraph station in any Out Island for radiotelegraphic communication between such Out Island and any other parts of the Colony and parts beyond the limits of the Colony, and for such purpose to make and enter into any contract as may be requisite.

(*c*) To grant licenses for the erection, construction, establishment or maintenance of instruments or apparatus for the purpose of transmitting or receiving messages within the Colony and across the seas by means of radiotelegraphy and for the transmission or reception of any such messages. Any license granted under this Act shall be subject to such conditions and restrictions as the Governor in Council may prescribe.

(*d*) To make rules—

(i) for the proper and efficient working of any radiotelegraph station from time to time established under this Act;

(ii) fixing the rates and charges for the transmission of messages thereby;

(iii) regulating the conditions under which messages may be transmitted;

(iv) prescribing the duties of the operators and probationers employed at any such station;

(v) for controlling the user of any instruments or apparatus erected, constructed, established or maintained under a license granted under this Act and the transmission or reception of any messages thereby;

(vi) for the training and examination of probationers;

(vii) for obtaining secrecy on the part of all persons employed in or in any way connected with the maintenance and working of any radiotelegraph station established under this Act and prescribing the form and nature of any oath of secrecy to be taken by any such persons; and

(viii) generally for fully carrying into effect the objects of this Act.

(2) All radiotelegraph stations established under sub-sections (*a*) and (*b*) of sub-section (1) of this section shall be under the control of the Governor in Council.

4. It shall be lawful for the Governor, when in his opinion an emergency has arisen in which it is expedient for the public service that His Majesty should have control over the transmission and reception of messages to or from any radiotelegraph station in the Colony, to take possession of and assume control of any radiotelegraph station in the Colony to be used for His Majesty's service and subject thereto for such ordinary service as may seem fit, or to direct and authorise such persons as he thinks fit to assume the control of the transmission and reception of messages either wholly or partly and in such manner as he directs.

5. (1) Whosoever shall unlawfully and maliciously cut, break, throw down, destroy, injure, remove or in any way interfere with any battery, machinery, wire, mast, post or other matter or thing whatsoever being part of, or being used or employed in or about any radiotelegraph station under this Act or in the working thereof shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for five years.

(2) Whosoever shall unlawfully or maliciously in any manner whatsoever prevent or obstruct the sending, conveying or delivery of any communication by radiotelgraphy under this Act shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for two years.

Provided that if it shall appear to any magistrate upon a preliminary inquiry into an offence against this section that it is not expedient to the ends of justice that any person charged with an offence against this section should be prosecuted in the Supreme Court, such magistrate may proceed summarily to hear and determine the charge and the offender shall on conviction thereof at the discretion of the magistrate, be liable to a penalty of £10 or to be imprisoned for one year.

6. Any person employed or engaged in any capacity whatsoever under this Act who shall, contrary to his duty, disclose or in any way make known or intercept the contents or any part of the contents of any message transmitted or received or to be transmitted or received to or at any radiotelegraph station under this Act shall be guilty of a misdemeanour and being convicted thereof shall be liable to be imprisoned for one year.

7. Whosoever shall unlawfully and maliciously by any overt act attempt to commit any of the offences mentioned in sections 5 and 6 of this Act shall on conviction thereof before a magistrate be liable, at the discretion of the magistrate, to a penalty of £5 or to be imprisoned for three months.

8. Any person who erects, constructs, establishes or maintains or commences to erect, construct, establish or maintain any instrument or apparatus for the purpose of transmitting or receiving or who transmits or receives messages within the Colony or across the seas by means of any radiotelgraphy whatsoever without having first obtained a license so to do under this Act, shall be liable on summary conviction before a magistrate to a penalty of £200 or to be imprisoned for one year, anything in the Magistrates Acts, 1896 to 1909, or any Act passed in amendment thereof or in substitution therefor to the contrary notwithstanding.

9. Any radiotelegraph station established under this Act with funds granted by the Legislature and any apparatus, machiney, matter or thing used in connection therewith, is hereby declared to be the property of the Government of the Colony, and in all legal proceedings whatsoever instituted and taken in relation thereto the same may be laid and referred to as the property of the said Government.

10. The Acts set out in the Schedule to this Act are hereby repealed.

SCHEDULE.

Regnal Year and Chapter.	Short Title.
2 Ed. VII c. 22	The Wireless Telegraphy Restriction Act, 1902.
3 Ed. VII c. 17	The Wireless Telegraphy Restriction Amendment Act, 1903.

RULES MADE BY THE GOVERNOR IN COUNCIL ON THE 3RD DAY OF NOVEMBER, 1913, UNDER THE AUTHORITY OF THE TELEGRAPH ACTS 1891 TO 1913.

BParagraphs 1-14 inclusive refer solely to the wired telegraph system.

15. The radiotelegraph system shall be operated under the rules contained in the "Detailed Service Regulations" appended to the International Radiotelegraph Convention signed at London on the 5th day of July, 1912.

A copy of such "Detailed Service Regulations" shall be kept on file in the telegraph offices.

16. All apparatus for radiotelegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(*a*) Naval signalling, or

(*b*) the working of any radiotelegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

17. No apparatus for radiotelegraphy on

board a merchant ship shall be worked or used whilst such ship is in the territorial waters of the Colony, except with the special or general permission in writing of the Governor.

18. Rules 16 and 17 shall not apply to the use of radiotelegraphy for the purpose of making or answering signals of distress.

19. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by radiotelegraphy the use of radiotelegraphy on board merchant ships whilst in the territorial waters of the Colony shall be subject to such further rules as may be made by the Governor in Council from time to time and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

20. The master of any merchant ship on board of which apparatus for radiotelegraphy shall be worked or used contrary to these Rules shall on summary conviction before a Magistrate be liable to a penalty of £200 and in default of payment to be imprisoned for a period of twelve months.

TARIFF OF CHARGES.

21. From New Providence to the American Coast ninepence-halfpenny a word, plus the charges over the lines of other telegraph administrations, as published in the tariff book of the Western Union Telegraph Company, a copy of which shall be kept on file in the telegraph offices.

From New Providence to radio ship stations, threepence for each word, plus the rate charged by the ship station.

A "Deferred Message Service" at half the ordinary charge per word is in effect between the Bahamas and certain other countries.

A list of such countries and a copy of the rules governing this class of message shall be kept on file in the telegraph offices.

Made by the Governor in Council this 3rd day of November, 1913.

By order,

W. B. HADDON-SMITH, Captain,
Clerk to the Executive Council.

BAHREIN ISLANDS

(See PERSIA.)

BARBADOS

(See map on p. 376.)

BARBADOS (latitude 13° 4′ N. and longitude 59° 37′ W.) is the most easterly of the West Indian Islands. Its superficial area is reckoned at 166 square miles, or rather more than that of the Isle of Wight. It fell first under British rule in 1605 and has so remained ever since, recording the fact in its most favoured epithet, "Ever British."

CONTROL AND ORGANISATION.

Wireless telegraphy in this Colony owes much to a wireless club formed amongst a number of young Barbadians. Starting with some home-made apparatus, whose aerials were supported on bamboo poles, the local radiotelegraphic station, after the commencement of the late war, developed rapidly, assisted by a private subscription list, which was headed by the Governor and Members of the Legislative Council.

Practical demonstration of its utility became so unmistakable that a two-kilowatt installation was erected and maintained for defence purposes, but affording every facility (compatible with military considerations) to merchants and shipping agents. Since the cessation of hostilities the station is open for general public correspondence and worked in accordance with the International Radiotelegraphic Convention.

This constitutes the only land station in Barbados, and is worked under Government control.

There are no regular aviation or meteorological services, but local weather reports are available to ships on request. There are no time, hydrographic or press signals.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
H. C. Rose, Assoc. I.R.E...	O. C. Wireless Station	Barbados.
W. C. Fenty, Assoc., I.R.E.	Chief Operator	Barbados.
P. W. Croney	Second Operator	Barbados.

ADMINISTRATION.

Wireless telegraphy in Barbados is worked under three Acts and one set of regulations, the Barbados Wireless Act of 1905, two Amending Acts, passed in 1913 and 1917, and a number of rules made under these latter acts.

As these are quite distinct, we publish their respective texts below:—

A—Wireless Act, 1905 (confirmed 1908).
B—Wireless and Submarine Telegraph (Amendment) Act, 1913.
C—Wireless and Submarine Telegraph (Amendment) Act, 1917.
D—Rules made under the 1913 and 1917 Acts.

WIRELESS ACT, 1905 (CONFIRMED 1908).

A 1. This Act may be cited as the Wireless and Submarine Telegraph Act, 1905.

2. (1) The West India and Panama Telegraph Company shall not lay down or maintain a new telegraph cable nor shall any other company or person lay down or maintain any telegraph cable upon the foreshore and bed of the sea except under and in accordance with an Act of the Legislature.

(2) A person shall not establish any wireless telegraph station, or instal or work any apparatus for wireless telegraphy in any place in this island except under and in accordance with an Act of the Legislature.

(3) If the West India and Panama Telegraph Company lays down or maintains a new telegraph cable or if any other company or person lays down or maintains any telegraph cable upon the foreshore or bed of the sea without the authority of an Act of the Legislature in that behalf, the company or person shall be liable, on conviction before a Police Magistrate to a penalty not exceeding £100, and shall forthwith remove the telegraph cable, and if the telegraph cable be not removed within one day after such conviction the company or person shall be liable to a penalty not exceeding £50 for each day thereafter during which the company or person shall fail to remove the telegraph cable. Provided, that the Governor-in Executive Committee may at any time after the expiration of one day from the date of the conviction cause the same to be removed and destroyed.

(4) If any person establishes a wireless telegraph station without the authority of an Act of the Legislature in that behalf, or instals or works any apparatus on any place in this island for wireless telegraphy without such authority in that behalf, he shall be liable, on conviction before a Police Magistrate, to a penalty not exceeding £100, and further be liable to forfeit any apparatus for wireless telegraphy installed or worked without such authority.

(5) If a Police Magistrate is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without legal authority in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place within his jurisdiction without such authority in that behalf, he may grant a search warrant to any police officer named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station or place and to seize any apparatus which appears to him to have been used, or intended to be used, for wireless telegraphy therein.

(6) No proceedings shall be taken under any of the provisions of this section except by order of the Governor.

WIRELESS ACT, 1913.

Passed on April 11th, 1913.

B 1. This Act may be cited as the Wireless and Submarine Telegraph (Amendment) Act, 1913 (1913-16).

2. (1) *Making of Rules and Regulations.*—The Governor-in-Executive Committee may from time to time make rules and regulations governing the use of wireless telegraph apparatus on merchant ships, British or foreign, while in the territorial waters of this Colony.

(2) *Ratification.*—Such rules and regulations when sanctioned by both Houses of the Legislature and assented to by the Governor, shall come immediately into operation and shall have the same force and effect as if the same had been herein expressly enacted.

(3) *Penalties.*—If the master of such ship or any person on board such ship commits a breach of any of these rules and regulations:

(*a*) The ship shall be subject to a maritime lien in favour of His Majesty the King, his heirs and successors, for a sum of one hundred pounds, and the amount so charged may be sued for and recovered in the Colonial Court of Admiralty;
(*b*) The ship may be detained by force if necessary by the Harbour and Shipping Master or his chief clerk, with the aid of the harbour police, until payment of the lien aforesaid or until arrested under process of the Colonial Court of Admiralty;
(*c*) The master of such ship shall be liable to a penalty not exceeding fifty pounds.
(*d*) The person committing the breach shall be liable to a penalty not exceeding fifty pounds.

3. (1) *Special Orders.*—In any case of urgency which is not provided for in the rules and regulations, the Governor may make any special order, and such order shall come immediately into operation and shall have the same force and effect as if the same had been herein expressly enacted.

(2) *Penalties.*—If the master of such ship or any person on board such ship commits a breach of any special order, the ship shall be subject to the maritime lien imposed by section 2 of this Act for the amount therein mentioned and may be detained as is therein provided, and the master, and the person committing the breach, shall be liable to a penalty not exceeding fifty pounds.

AN ACT

C To amend the Wireless and Submarine Telegraph Amendment Act, 1913. (1913-16.)

Be it enacted by the Governor, Council, and Assembly of this island, and by the authority of the same, as follows:—

1. This Act may be cited as the Wireless and Submarine Telegraph (Amendmeut) Act, 1917.

2. The Wireless and Submarine Telegraph (Amendment) Act, 1913, is hereby amended by inserting the words "and yachts" immediately after the words "merchant ships" in line three of subsection 1 of section 2 thereof, and the word "ship" wherever occurring in the subsequent parts of the Act shall be construed as including a yacht.

3. The Regulations made under the authority of the said Act by the Governor-in-Executive Committee on the thirty-first day of July, nineteen hundred and thirteen, shall apply to yachts as fully and in the same manner in all respects as they do to merchant ships.

RULES MADE BY THE GOVERNOR IN EXECUTIVE COMMITTEE UNDER SECTION 2 (1) OF ACT 1913-16, ON JULY 31ST, 1913, CONFIRMED AUGUST 11TH, 1914.

D 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with (*a*) Naval signalling or (*b*) the working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the Colony except with the special or general permission of the Colonial Secretary of the Colony.

3. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

BASUTOLAND

(See SOUTH AFRICA, UNION OF.)

BASUTOLAND, an inland native territory of South Africa lying between 28° 45′ and 30° 40′ S. latitude, and a longitude of 27° 0′ and 29° 30′ E., is governed by a resident Commissioner under the direction of the High Commissioner for South Africa and located at Maseru, its principal town. The latter high official possesses legislative authority which is exercised by proclamation. The "Territory" covers an area of 11,716 square miles, and has been directly under the authority of the Crown since 1884; it forms an irregular parallelogram on the north-east of the Cape Colony, and the seven districts into which it is divided bear the reputation of including the finest agricultural and pastoral land in South Africa.

ADMINISTRATION.

In 1904 a proclamation was issued, which we print below, making provision for the working of wireless telegraphy within the territory, but at present there are no wireless stations.

A—Proclamation making provision for Wireless Telegraphy.

A PROCLAMATION.
No. 5 of 1904.

By His Excellency the High Commissioner for South Africa.

Whereas it is expedient to make provision for the working of wireless telegraphy within the territory of Basutoland;

Now therefore by virtue of the powers in me vested I do hereby proclaim, declare and make known as follows:

1. No person shall establish or use any apparatus or installation for the transmission of messages or other communications by means of electrical energy without the aid of wires without having previously obtained a license as hereinafter provided.

2. (1) It shall be lawful for the Resident Commissioner to authorise the issue of a license for either of the purposes mentioned in section 1 and to revoke the same at any time, and there shall be payable in respect of such license the sum of one hundred pounds.

(2) Every such license shall be deemed to be granted upon such terms and conditions as the High Commssioner may from time to time prescribe by notice in the *Gazette*.

3. Any person who shall establish or use or attempt to establish or use any such apparatus or installation as is mentioned in section 1 in contravention of the provisions of this Proclamation shall be liable upon conviction to a penalty not exceeding two hundred and

fifty pounds and in default of payment to imprisonment with or without hard labour for a period not exceeding three months and in case of a second or subsequent conviction to a penalty not exceeding five hundred pounds or in default of payment to imprisonment with or without hard labour for a period not exceeding six months.

4. This proclamation shall take effect from the date of its publication in the *Gazette*.

Given under my hand and seal at Johannesburg this twenty-fourth day of February, One thousand nine hundred and four.

MILNER,
High Commissioner.

BELGIAN CONGO

FOUNDED in 1885 by the late Leopold II, King of the Belgians, the Congo "Free State" was placed under his sovereignty. It was subsequently annexed by Belgium under the Provisions of the Treaty of November 28th, 1907. The governing body of the colony consists of fourteen members, eight of whom are appointed by the King of the Belgians, three chosen by the Senate, and three by the Chamber of Representatives. The King is represented in the colony by a Governor-General assisted by several Vice-Governors-General. Its area is estimated at nearly one million square miles, and it possesses a population of about seven millions.

CONTROL.

The wireless telegraphic service of the Belgian Congo possesses a General Directorate at Brussels and a Local Directorate at Stanleyville, in the colony.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
At Brussels—		
Lt.-Col. Adjoint d'E. M. A. Wibier	Director-General	2, Rue de L'Esplanade, Brussels
M. François Bezerie	General Secretary	Do.
M. Raymond Braillard	Chief Engineer	Do.
In the Congo—		
M. Fernand Vourguet	Director	Stanleyville
M. Duwez	Assistant Director	Do. Kanga
M. Mathieu	Controllers	Coquilhatville
M. Van Cleynenbreughel	Controllers	Stanleyville
M. Mouchet	Controllers	Elizabethville

The network with Boma at the head is divided into sections comprising 14 stations as follows :—

(1) The section of the Bas-Congo-Kasai, comprising the stations of Banana (the coastal station), Boma, Kinshasa, Lusambo (C.W.).

(2) The section of the Equator: Coquilhatville (being reconstructed to C.W.), Basankusu, Umangi-Lisala, Basoko.

(3) The section of Stanleyville (being replaced by a high power C.W. station to communicate direct with Elizabethville 1,360 km. and Kanga 1,500 km.), Bunia-Kilo

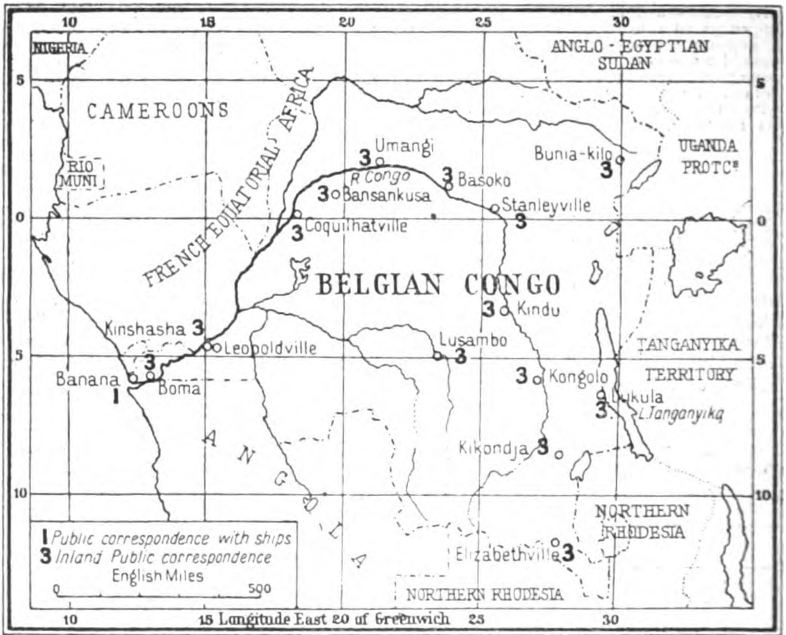
(4) The section of Lualaba: Kindu, Kongola (Lukuga), Kikondja, Elisabethville (being reconstructed as Stanleyville to communicate direct Boma-Kanga, 1,680 km.)

In addition to these there is a small station at Usunbura, which is looked after by the Special Administration of the Urundi-Ruanda. The wireless telephone stations (C.W.) are set up around Tchikapa (Kasai).

At the head of each section is a chief, assisted by chief operators of stations and constructional engineers.

ORGANISATION.

As a result of his travels in the Congo, King Albert was impressed with the great inconvenience caused by lack of suitable communication between the principal settlements of this vast colony, and decided from that moment to remedy this defect.



At the end of 1910 he drew up a programme in three parts of which the first consisted of linking Boma with Banana as a test. On the results obtained was to be considered the question of instituting another section, that of communication between Boma and Elisabethville. a much more important scheme in view of the fact that this part of the colony had never before made use of wireless telegraphy. The third point included wireless communication between the Congo and Belgium, at first by means of relay stations, and subsequently direct.

In January, 1911, the first two stations were installed—at Banana and Boma—able to communicate with the coast station at Loango which was, in turn, the terminal point of a submarine cable. The same year the King charged Mr. Goldschmidt and Captain (now Lt.-Col.) Wibier to instal a chain of stations in such a way as to form a wireless nexus throughout this vast territory. As a result Kinshasa, Coquilhatville, Lusambo, Bansankusa, Umangi-Lisala, Basoko, Stanleyville, Kindu, Kongolo, Kikondja, and Elisabethville stations were erected.

This network has been completed, and during the war the stations of Bunia-Kilo and Lukuga were opened to service. Actually there are fifteen wireless stations now working in the Belgian Congo. In addition there are under construction a station at Buta, in the district of Uele, and a powerful inter-continental station at Kanga (Boma), the latter destined for direct communication with Belgium.

Finally, steps are being taken which it is hoped will enable the three local capitals of Boma, Stanleyville and Elisabethville to directly intercommunicate without resorting to the use of relay stations.

The general traffic dealt with by the system exceeded 500,000 words in 1913, and 5,000,000 words in 1920, and is being increased daily.

There are no stations utilised for aviation purposes.

The stations at Kinshasa, Coquilhatville, Umangi-Lisala, Lusambo, Bunia-Kilo, Luhuga, Kindu, Stanleyville and Elisabethville intercept press telegrams from Europe, which are sent free to the colony. They receive also time signals from Lyons.

During 1921 the first attempts at Wireless Telephony were made in the district of Tchikapi (Kasai). They were undertaken by Mr. Goldschmidt for the International Society of Forestry and Mining, who installed a private station to relay them to the main system.

ADMINISTRATION.

The rules under which wireless telegraphy is administered in the colony are those of the Wired Telegraphic Service now in force. There are none specially devoted to wireless. The staff has to pass a severe examination at the headquarters at Brussels which decides the engagements.

BELGIUM

BELGIUM, after being joined with Holland from 1815, formed itself into an independent State in 1830, under Prince Leopold of Saxe-Coburg, who ascended the throne on July 21st, 1831. According to the constitution of that date, Belgium is "a Constitutional Representative and Hereditary Monarchy," the legislative power being vested in the King, the Senate and the Chamber of Representatives. The present King Albert, born on April 8th, 1875, succeeded his uncle on December 17th, 1909.

The total area of the kingdom was estimated before the war at 11,373 square miles, and was divided into nine provinces, the capital city being Brussels. At the Paris Peace Conference the territory of Eupen, Malmedy and Moresnet was allotted to Belgium.

CONTROL.

Wireless telegraphy in Belgium is under the control of the Ministry of National Defence with regard to the Army and Navy and the Telegraph and Telephone Administration, which forms one of the departments of the Ministry of Railways, Marine, Posts and Telegraphs for public service.

For technical purposes the Administration is divided into two departments and six districts. Each district, administered by an engineer-in-chief and assisted by a principal engineer and other engineers, includes several sections or special technical services.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. Poullet	Minister of Railways, Marine, Posts and Telegraphs	Brussels
Mr. A. Roosen	Director-General of Telegraphs and Telephones	Do.
Mr. Pierard	Director-General of Marine	Do.
Mr. E. Pierard	Director of Telegraph Administration	Do.
Mr. C. Dussart	Director of Fifth Technical District, Telegraph Department	Do.
Mr. P. Dubois	Principal Engineer, Fifth Technical District, Telegraph Department	Do.
Mr. R. Corteil	Chief Engineer, Wireless Technical Service	Do.
Mr. Van Heemstée	Assistant Engineer, Wireless Technical Service	Do.
Mr. C. Caenepenne	Assistant Engineer, Wireless Technical Service	Do.

ORGANISATION.

In 1901, when wireless was still in its infancy, trials were made between La Panne and a Belgian mail boat, to which trials, Mr. A. Roosen, Director-General of Telegraphs; Mr. Pierard, Director-General of Marine; and Mr. E. Pierard, Director of the Telegraph Administration, devoted all their

attention, and contributed to the application and development of wireless in Belgium.

The results obtained having been adjudged sufficiently satisfactory for the establishment of wireless between the mail boats and the Belgian coast, provision was made in 1902 for the installation of a coast station at Nieuport (Bains), and of ten stations on the mail boats, for the purpose of increasing the security of navigation of these ships. This was the first public wireless service inaugurated on any ship afloat.

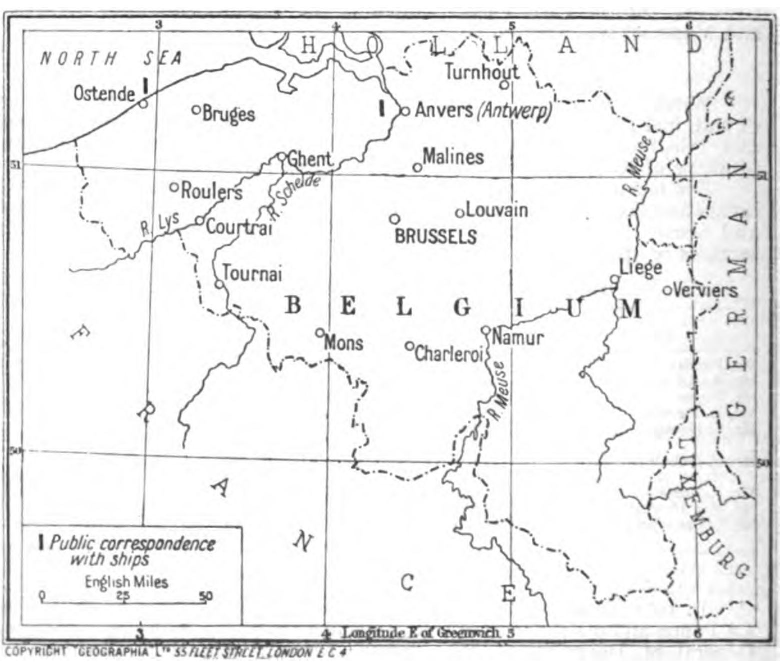
As progress was made in the domain of wireless, experiments were undertaken to establish the value of improved methods and new apparatus. These trials led in 1909 to plans for completely reorganising the original installations. Subsequently, modifications were introduced at Nieuport (Bains) and to the mail boat installations.

The application of wireless in Belgium is perforce limited, on account of the small extent of territory affected, the necessity of avoiding interference with the stations in neighbouring countries, and the network of existing telegraph lines and other apparatus for speedy communication.

A temporary station is in operation at the waterworks at Ostend, until the new Ostend station is ready, and is fitted with a 5 kw. Marconi musical spark installation, as well as with a 1 kw. C.G.R. installation.

Another station is in operation at the Pilot House at Antwerp, fitted with a 1 kw. S.F.R. installation. This station will shortly be provided with a 10 kw. musical spark set. A private coast station for the Pilot Service is in contemplation.

Provision is being made for the installation of radiogoniometric stations on the Belgian coast.



There are two stations at Brussels, Evère and Uccle.

The new steam pilot boats will be equipped with wireless telegraphy; also lightships and Government tugs. The North Sea survey ship, *Ville d'Anvers* already has a wireless installation in operation.

An intercontinental station is projected in Western Belgium, and tenders have been invited. An European station is also to be established.

ADMINISTRATION.

The administration of Wireless Telegraphy in Belgium is regulated by a Law and Royal Decrees, which are reprinted below :—

- A—Law of July 10th, 1908, regulating the use of wireless telegraphy and telephony.
- B—Royal Decree of October 19th, 1908, regulating the application of charges on wireless messages.
- C—Royal Decree of November 3rd, 1913, regulating the conditions of installation and the working of wireless stations.
- D—Decree regulating ships' licenses, September 10th, 1918.
- E—Technical and administrative regulations relating to ship stations, October 15th, 1918.*
- F—Circular No. 1 of October 18th, 1918, addressed to shipowners.
- G—Decree regarding Amateur Wireless Installations.

A 1. LAW OF JULY 10TH, 1908, RELATING TO TELEGRAPHY AND TELEPHONY BY ETHER TRANSMISSION.

ART. 1.—The Government is authorised to undertake the establishment and transmission of wireless telegraphy and telephony by ether waves.

ART. 2.—On Belgian territory or on board of a Belgian steamer or vessel no one is allowed without authorisation previously obtained from the Government to erect, establish or cause to be erected or work apparatus for radio transmission capable of carrying out or prejudicing communications.

Each infraction of the clauses of the provisions of the present Article involves liability to a fine varying from 200 to 2,000 francs, together with imprisonment varying from eight days to a year, or either of these penalties alternatively. Such infringement will carry the additional penalty of confiscation for the benefit of the State of the apparatus and all other objects specially designed for their working. Moreover, the Law Officers shall be able to order suspension in the carrying out of the confiscation of all apparatus and other objects or of a part thereof by placing them in temporary sequestration for a term which may be fixed by the tribunal. This sequestration shall be raised if the interested party or his legal representative shall obtain authorisation to make use of the apparatus. In default of such authorisation, the confiscation of his effects shall take place immediately on the expiry of the term fixed under the judgment, unless the competent Minister shall authorise the delinquent either to destroy the apparatus or to transfer its possession to a duly authorised concessionaire.

The preceding arrangements shall apply even in case of acquittal of the accused, when it has been established that the apparatus and other objects giving rise to the prosecution come under the category covered by the two first paragraphs of the present Article.

ART. 3.—The Government shall fix the rates, as well as the rules of administration and order relative to radiotelegraphy and telephony. Infringement shall be punished in accordance with the penalties established by the law of March 6th, 1908.

ART. 4.—The authorisations referred to in Art. 2 are granted by the Minister exercising jurisdiction over the telegraphic and telephonic services in agreement with the other ministers affected. They shall specifically enumerate their duration, the conditions of installation, use of apparatus, charges where such are made, royalties payable to the public treasury, penalties for infringement and all other limiting conditions, dictated by the interests of public order, as well as by the security and defence of the realm. In the event of infringement of the conditions of authorisation, the latter may be withdrawn by the Minister who granted it. Nevertheless, no royalty can be claimed when it has been proved to the satisfaction of the Minister in Charge of the granting of authorisations that the applicant has no other object than that of experimenting with or making use of the apparatus for his private purpose without making any charge whatsoever.

ART. 5.—No one can establish or work on board a foreign ship or vessel apparatus for radio transmission which can carry out or prejudice radiotelegraphic or radiotelephonic communication, so long as the ship, or vessel, is located in Belgian Territorial Waters, if its action be not in accord with the prescribed regulations set out in Art. 3. The competent Minister may at any time forbid the use of apparatus, or lay down with regard thereto such measures of precaution, supervision and control as he judges necessary.

All infringements of the regulations of the present Article are liable to a fine of 100 to 500 francs. The Law Officers may order the sequestration of apparatus, and of all other objects specifically adapted to their working, for the duration of the stay of the aforesaid vessel in Belgian waters. Such sequestration may be annulled if the interested party obtain from the competent Minister an authorisation to make use of the apparatus in question.

* The Regulations of October 15th, 1918, are specially adapted for wartime, and will soon be modified to suit peace conditions.

If, after the annulment of the sequestration, the interested party commits a fresh infraction of the conditions laid down, the fine may be doubled and the apparatus and other objects confiscated for the benefit of the State.

ART. 6.—If for any cause, either by reason of public order or the security and defence of the realm, the Government shall judge necessary to suspend the whole, or part of the service, the concessionaire shall be obliged to obey the first instructions given him to that end.

In the same circumstances the competent Minister may either order the apparatus to be put out of action or sequestrated, or he may put the apparatus in the hands of his own agents instead of those of the concessionaires, These measures shall be taken for the duration of the period judged necessary by the Government and shall give rise to no claim for indemnification at the hands of the State.

ART. 7.—The penal laws relative to wireless telegraphy and telephony are applicable to governmental radiotelegraphy and telephony, as well as to such installations and services as have been duly authorised for public communication.

ART. 8.—The Government may designate the functionaries who shall be sworn in as officers of judiciary police for the investigation of the infringement relative to wireless telegraphy and telephony. The official reports drawn up by these functionaries shall be considered correct until they are proved otherwise.

The above-mentioned functionaries shall take precedence, so far as infringements relative to wireless telegraphy and telephony are concerned, over all other officers of judiciary police, with the exception of the Public Prosecutor and the Police Magistrate.

ART. 9.—When there are found to be sufficient traces of the existence of wireless telegraph or telephone installations not regularly authorised or employed, the police magistrates shall visit the localities in which the aforesaid installations shall be presumed to exist, in order to make all necessary investigations into the truth of the allegations, even although it may be necessary to secure access to private property for that purpose.

He may take with himself one or more experts or functionaries sworn in in accordance with the terms of the preceding Article.

He may either effect himself or cause to be effected, by any and all of the officers of the judiciary police, seizure or dismantlement or temporary sequestration of the apparatus set up or employed without regular authorisation, as well as that of all other objects subject to confiscation in accordance with the terms of Arts. 2 and 5 heretofore set out.

ART. 10.—The State undertakes no responsibility for the service of communication by radiotelegraphic or radiotelephonic means.

ART. 11.—The present law shall come into operation the day after its publication.

B 2.—ROYAL DECREE OF THE 19TH OCTOBER, 1908, RELATING TO CHARGES FOR RADIO-TELEGRAMS.

Royal Decree authorising the Minister of Railways, Posts and Telegraphs to settle the amount of charges fixed when necessary in the authorisation for delivery by application of Articles II and IV of the Law of the 10th July, 1908, relating to wireless telegraphy and telephony by ether transmission.

. . . .

In view of the Law of the 10th July, 1908, relating to wireless telegraphy and telephony;

In view of the International Radiotelegraphic Convention concluded at Berlin in 1906 and the further Acts which complete it:

and

Inasmuch as it is desirable to simplify—so far as charges are concerned—the formalities which appertain to the delivery of Acts authorising the establishment and working of ether transmission, at the suggestion of our Minister of Railways we hereby agree:

Sole Article.—Within the limits fixed by the International Convention relating to Radiotelegraphy and Telephony, our Minister of Railways, Posts and Telegraphs is hereby authorised to settle the amount of charges, when such arise, in the authorisations which he is empowered to issue under the authority of Articles II and III of the Law of the 10th July, 1908.

Given at Laeken, the 29th October, 1908.

(Sgd.) LEOPOLD.

C 3.—ROYAL DECREE OF THE 3RD NOVEMBER, 1913, RELATING TO THE CONDITIONS UNDER WHICH WIRELESS TELEGRAPHY SHALL BE INSTALLED AND WORKED.

In view of Art. III of the Law of 10th July, 1908, which authorises the Government to settle the rules of administration and police relative to radiotelegraphy and telephony:

In view of the Law of 6th March, 1908, relating to the penalties incurred by contravention of general measures of interior administration, as well as to the penalties which may be inflicted under the rules laid down by provincial and communal authorities:

and

In view of the proposal of our Minister of Marine, Posts and Telegraphs, we have settled and hereby decree:

ART. 1.—On Belgian territory and on board ships or vessels of Belgian nationality, every and each proposal for the installation of apparatus for ether transmission, capable of assisting or prejudicing the transmission or reception of radiotelegraphic or radiotelephonic signals, as well as all proposals for modification in their employment, and also every and each proposal for the erection or modification of an installation which has already been duly authorised, ought to be submitted to the Department of Marine, Posts and Telegraphs as a preliminary to their starting operations.

Any request for authorisation must indicate the character of the installation, the object of its use, so far as concerns wireless stations on board ship tariff of charges proposed. detailed list of the apparatus and of the methods of working, wavelengths, hours of watch, and generally all information of a character such as will facilitate detailed examination of the scheme. There shall be moreover thereon set forth the steps it is proposed to take to prevent interference with the service of other official or authorised stations.

ART. 2.—Such authorisations are issued subject to the reservations and conditions which may be judged necessary in the interests of the convenience and defence of the realm, including the safeguarding of public and service messages.

ART. 3.—A new authorisation becomes necessary:

1. If the station has not been installed or modified and put in working order within the period fixed by the Decree of Authorisation.

2. If it has been put in working order or made use of under the conditions other than those set out in the Decree of Authorisation.

Art. 4.—Installations not regularly authorised which shall have been set up previous to the coming into force of the present Decree shall not be privileged thereby: their service must be suspended and a request for authorisation applied for under the conditions and forms set out under Article I of the present Decree.

Art. 5.—On entering into Belgian territorial waters foreign ships fitted with wireless installations capable of assisting or prejudicing transmission or reception of radiotelegraphic or radiotelephonic signals shall cease communication with any neighbouring stations other than the nearest State stations. They shall announce their presence to these coastal stations and await authorisation or invitation to communicate either with the aforesaid or some other coastal station.

The preceding arrangements shall not apply to foreign ships and vessels, provided that previous to their entering within Belgian territorial waters they shall have been provided under order of the competent Belgian Minister with his special and regularly accredited permit for communication. They shall not interfere in any way with distress signals or the answers to distress signals emanating from other ships or vessels.

To sum up: Foreign ships and vessels are enjoined from the time of their entering into Belgian territorial waters to cease all working which may prejudice the communications of any radiotelegraphic or radiotelephonic stations whatsoever.

Art. 6.—On Belgian territory and within Belgian territorial waters as well as on board Belgian ships and vessels located in foreign waters, duly appointed delegates of the Government shall have free access at all hours of day and night, in accordance with Article VIII of the Law of 10th July, 1908, to all ships, vessels and steamers on which regularly authorised installations may be working, or for which a communicating permit has been granted. The owners, managers, charterers, commanders, agents, masters, and personnel are enjoined to facilitate by every possible means the duties of verification and control vested in these delegates.

Art. 7.—The owners, managers and charterers are civilly responsible for the payment of fines decreed against their commanders, directors, agents, masters, or personnel. Our Minister of Marine, Posts and Telegraphs is charged with the execution of the present Decree.

Art. 8.—The present Decree shall come into force the day after its publication dated Brussels, 3rd November, 1913.

4.—DECREE OF THE 10TH SEPTEMBER, 1918, RELATING TO SHIPS' LICENSES.

Albert, King of the Belgians, to all here present and to come, greeting.

In view of Art. 26 of the Constitution which confers the exercise of legislative power on the Ruling Sovereign, in concert with the Chamber of Representatives and the Senate; and in view of the impossibility of assembling the Legislative Chambers.

Under the advice of our Minister of Railways, Marine, Posts and Telegraphs, and Foreign Affairs, and in conjunction with our Ministers united in Council we have decreed and do decree.

Art. 1.—On and after 15th October, 1918, it is enacted that before starting from either a Belgian port or a port belonging to an allied or neutral nation of Belgium, sea-going vessels engaged, or that may become engaged wholly or partially in commercial transport, must be furnished with a license issued in the name of the Minister of Railways, Marine, Posts and Telegraphs, by the Director-General of Marine or by his representative.

Art. 2.—Other requests for licenses must come from the ship owner or charterer or their agents and must be set out in writing in conformity with the provisions of a model approved by Ministerial decree.

Art. 3.—Every license shall be issued for one or several voyages or for a limited period. Any license given for more than a single voyage is always liable to cancellation.

Art. 4.—A license will be refused whenever the authority entrusted with the investigation of the request shall judge that the vessel may—so far as the itinerary or conditions of shipment are concerned—be utilised in a manner more convenient for national interests than it would be if the voyage were carried out under the arrangements set forth in the application, or when such a voyage as that therein set forth would unduly expose the vessel to the risks of war, which the national interests demand shall be avoided.

Art. 5.—A license shall be also refused if the authority entrusted with the investigation of the request shall judge that by its general condition, or that if its engines, fittings, means of defence, or composition of personnel, the vessel is insufficiently well-found with regard to safety for the voyage for which the license is being requested.

Art. 6.—Marine Commissioners, Consuls, and Agents designated for that purpose by the authority entrusted with the consideration for the request for license, shall have the right of access at all times and in all places on board of Belgian sea-going vessels with the object of investigating whether the aforesaid vessel fulfils the conditions necessary for the granting of a license or whether the conditions under which the license may have already been granted are well and duly carried out.

Every owner, charterer, or master is enjoined to give the aforementioned officials every necessary aid in the discharge of their duties.

Art. 7.—The Marine Commissioner in Belgian ports and the Belgian Consul in foreign ports may, without prejudice to Art. 9 of the Decree of the 2nd February, 1916, withdraw the permission to navigate from any vessel not furnished with a license or which shall navigate in violation of the conditions of the present Decree.

They shall be able to arrest, or have it put under arrest by the local authorities—the ship may even be prohibited from putting to sea.

Art. 8.—In the event of violation of the regulations of the present Decree, the Marine Commissioner or the Council shall draw up a circumstantial indictment, every item of which shall hold good until disproved. A copy of this indictment will be sent within 24 hours to the captain of the ship.

Art. 9.—The captain, shipowner, or charterer, who may at any time have been guilty of an offence against the regulations of the present Decree, shall be liable to imprisonment varying from a week to two years, together with

a fine varying from 26 frs. to 2,000 frs., or, alternatively one of these penalties. Confiscation of the ship will be enforced, and if enforcement be not possible, the tribunal shall substitute therefor the payment of a fine equal to the value of the vessel.

If there be any extenuating circumstances, the confiscation of the vessel, or the payment of a sum equal to its value, may be obviated in consideration of a payment of some sum less than its value.

ART. 10.—All the provisions of Section I of the Penal Code apply to the infringement of regulations set out in the present Decree.

ART. 11.—Any individual, Belgian or foreign, who shall commit outside the Royal domains, an offence against the present Decree, can be proceeded against in Belgium. If he does not appear, judgment may be passed in default.

ART. 12.—So far as the present Decree is concerned, by "captain" may be understood any person who exercises the captain's function on board.

We hereby promulgate the present Decree and order that it shall be sealed with the State Seal and published in the *Moniteur*.

Given at our Headquarters,
10th September, 1918.

Sealed (ALBERT).

E REGULATIONS RELATING TO TECHNICAL CONDITIONS, INSTALLATION, UPKEEP, SURVEY AND TRAFFIC OF RADIOTELEGRAPHIC STATIONS ON BOARD BELGIAN VESSELS.*

Dated 15th October, 1918.

ART. 1.

Systems of Radiotelegraphic Apparatus.

The choice of wireless apparatus and arrangements to be employed is left open under the *express reservation of parliamentary approval*, by the Department of Railways, Marine, Posts and Telegraphs of Belgium, which is entrusted with the supervision and control of Radiotelegraphic Installations on board Belgian ships.

Account will be principally taken of the efficiency of the system from all points of view, including the reliability of machines and apparatus, facilities for supervision, for the upkeep of the station, for the replacement of apparatus or parts which may be damaged.

It is extremely desirable, however, that choice should be made of a system with a musical note. Such a kind of note will be obligatory for vessels plying in tropical zones.

ART. 2.

Construction of Radiotelegraphic Installation (Conditions to be fulfilled).

Installations must fulfil the conditions laid down in the Radiotelegraphic Convention of London, 1912, and the supplements thereto, modified by the present code of Rules and later on by subsequent regulations.

(*a*) *Principal Transmitting Station.*—Radiotelegraphic installations must be able to transmit by day, from one ship to another of the same class, signals which can be clearly read under normal circumstances and conditions at the minimum distance laid down hereafter.

200 nautical miles (about 1,852 metres) for vessels of 6,000 tons and upward.

100 nautical miles for vessels of 3,000–6,000 tons.

75 nautical miles for vessels of 1,500–3,000 tons.

40 nautical miles for vessels of less than 1,500 tons.

Special conditions with regard to range may be imposed for vessels devoted partly, or wholly, to long distance passenger traffic, or such vessels as ply under special traffic conditions.

With the object of enabling the operator to keep himself effectively in touch with, and to regulate the working of the transmitting station, and the energy radiated therefrom by the antennæ-earth circuits, there shall be supplied an unshunted thermal ammeter, specially adapted for measuring currents of high frequency.

It must be possible to pass rapidly from a wavelength of 600 metres to that of 300 metres and *vice versa*.

(*b*) *Apparatus for Syntonisation and Reception.*—Besides the regulating arrangements relative to the reception of wavelengths of 600 metres or less (*see* Service Regulation annexed to the London Convention of 1914, Art. 7, Section C), the apparatus must allow for reception, with a margin of insurance against interference of transmissions operated on a wavelength up to 3,000 metres.

Use must be made of sensitive and very stable detectors specially adapted for the reception of musical notes.

The reception apparatus must include at least two detectors.

Arrangements must be made for avoiding any induction due to badly established electric circuits, or to any other cause which may tend to obscure faint signals.

Some suitable arrangement must ensure the silence of receiving telephones during transmission, whether the latter is being made through the main station, or the emergency set.

A suitable and conveniently placed buzzer must be carried for the verification of the satisfactory working of the different circuits of the reception apparatus and of the detectors.

(*c*) *Emergency Transmitting Gear.—Every board-ship station, whatever may be the constitution of its principal Transmitting Station, must include an emergency set*, in conformity with Art. 11 of the Regulations of Service appended to the International Radiotelegraphic Convention of London, with the object of ensuring the possibility of reception when the current of the ship's generator fails, or some mischance puts the principal station out of action.

This emergency set must of necessity be actuated by an accumulator battery with a sufficient capacity and of at least 24 volts. If, however, the principal transmitting station carries an accumulator battery suitably equipped and located, this battery or a part thereof, may serve as the source of energy of the emergency gear.

The emergency set must have a minimum range of 80 nautical miles for vessels of 6,000 tons and upward; or for those of smaller tonnage, partly or solely engaged in long distance passenger service; of 50 nautical miles for vessels of 1,500–6,000 tons which do not come under the above-mentioned category; of 30 nautical miles for vessels of less than 1,500 tons.

When the emergency set includes an induction coil it must be possible to utilise it: (*a*)

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* These Regulations are specially adapted for wartime, and will soon be modified to suit peace conditions.

for transmitting by direct excitation (plain aerial); (b) for the emission of syntonised and slightly damped waves obtained by feeding the condenser of the primary oscillating circuit of the principal set from the secondary of this coil.

The above apparatus must allow of a rapid change from one of these methods of transmission to the other.

All arrangements must be made so that the emergency set may be put into action instantaneously.

ART. 3.

Antennæ.

(a) *General Conditions.*—Antennæ must always be maintained in perfect condition, not only with regard to rigidity but also with regard to electrical resistance.

All the connections of antennæ must be rigidly soldered with the greatest care. Soldering must be carried out with resin to the exclusion of all liquid which might act on metal.

Every precaution must be taken that no strain be put upon a soldered joint, or upon any part which has been heated.

The same precautions must be taken in the case of a broken connection.

Besides the principal antennæ which is in everyday use, there shall be carried on board a single-strand antenna in reserve as well as a small emergency antenna.

(b) *Principal Antenna.*—This must be of a multiple-stranded type strongly fixed.

This antenna must be furnished with straying guides suitably insulated, with their ends attached to the yards in order to avoid shifting under wind-strain or the motion of the ship.

(c) *Reserve Single Strand Antenna.*—In order to afford a temporary stopgap when the principal antenna has been badly damaged by bad weather and when circumstances render reconstruction impossible for some little while, and with the object of carrying on a makeshift radiotelegraphic service, every vessel must carry a single strand reserve antenna of a convenient shape and size. This antenna shall be stretched on a special support furnished with its own insulator—constructed of an unbreakable and elastic material like rubber or caoutchouced rope—and placed in the wireless cabin ready for the operator's use.

The two masts intended to serve as supports shall be furnished each with a reserve block fixed as high as possible and with a continuous halliard serving exclusively for the haulage of the single strand antenna. These blocks and gear for the spare set must always be maintained in perfect order.

(d) *Emergency Set.*—Experience has shown that the explosion of a torpedo or a mine fairly frequently entails the fall of a mast, and consequently tears down the antennæ at the same time, thus preventing the vessel from sending out wireless calls for aid.

In order to neutralise the consequences of such a mishap every ship must be furnished with a small emergency antenna *totally separate from the masts.*

This antenna must be multiple stranded with the object of ensuring a sufficient sending range. It may be of a prismatic or cylindrical type with four or six strands (of the pattern usually spoken of as "sausage"); it shall be fixed by the aid of blocks, say, on one side to the top of a funnel and on the other to the apex of a small spar attached to the wireless cabin or the wheel house, etc.

This antenna should be given as much extension, both from the point of view of capacity and height, as it is practically possible under the circumstances. In the neighbourhood of a funnel it would not be possible to use for its fixture either blocks, insulators or fastening material which might be affected by heat or steam such as ropes, ebonite, rubber, etc.). This emergency antenna must be permanently fixed on the exterior to an insulator with a special lead-in of a type similar to the insulator of the main antenna. Every care must be taken to ensure the practicability of its being instantly connected with the apparatus for transmission and reception in the interior of the cabin.

(e) *Metal Stays.*—The metal stays of masts and other gear, arranged more or less parallel and at a short distance from the strands of the antennæ, must be effectively broken by insulators of high mechanical strength in such a way as to avoid any appreciable absorption of energy.

(f) *Tension of Antenna Stays.*—Care should be taken against stretching the stays too tightly so as to avoid antennæ being torn away in consequence of severe vibrations of the mast head caused by explosion, collision, etc.

ART. 4.

Electric Generating Group.

Every electric generating group must be constructed and arranged so as to maintain continuous service.

(a) *Ship's Regular Generators.*—If there be machinery on board for lighting the ship, etc., it can equally well serve for supplying energy to the wireless station, provided that when all the apparatus for which it is normally employed is being served there remains an ample supply of electric power for working the radiotelegraphic installation.

(b) *Special System.*—For this purpose it is necessary to choose a very rigid system of construction which is not liable to derangement by powerful shocks and which can be quickly connected up. No systems of electro generation shall be allowed which do not possess a minimum power of 2½ kw. with compound excitation on the dynamo, machines of less power not being of the requisite robust qualities. A power of 2½ kw. must be exclusively reserved to the wireless station and contingently to the lighting of the wireless cabin. In the interests of the safety of the ship the electric generating group must be placed as far as possible in the upper part of the machinery room, or, if it consists of an internal combustion motor, in the immediate neighbourhood of the wireless telegraph station, but so situated that working does not interfere with the operator.

(c) *Working.*—The electric generating system shall work continuously throughout the voyage and the current must be always at the disposal of the operator.

In every gang of engineers one of them must be specially told off to conduct and maintain the electric generating system, and this duty must not in any case fall upon the operators.

(d) *Voltmeter.*—The switchboard belonging to the electric generating system must include an absolutely reliable voltmeter and ammeter.

ART. 5.

Location of the Wireless Telegraph Station—Cabin.

(a) *Location.*—The wireless station must be installed whenever possible on the upper bridge, not too much towards the stern of the ship because the revolutions of the screw produce vibrations which hinder the reception

of feeble signals. As far as possible a location shall be chosen free of smoke-stacks, chains, metallic fitments and, as far as possible, out of reach of the waves.

(*b*) *Cabin.*—This must be solid and well built, perfectly watertight and of a sufficient size to comfortably contain the apparatus, and to serve in case of need as quarters for the operators, besides being sufficiently sound-proof to allow of the reception of faint signals.

The motor alternator system of the sending station must be enclosed in a cupboard sufficiently sound-proof to prevent the noise made by its revolutions interfering with reception; the latter ought to be possible without involving any stoppage of the generating machine.

It is advisable to quarter the operating staff in the wireless cabin. This arrangement allows of the most rapid action in the case of mishap and consequently affords greater security.

If circumstances do not permit operators to have their bunks made up in the wireless cabin, choice shall be made for their location in a position as near as possible to the wireless station and on one of the upper decks.

The cabin must be fitted with an emergency lighting system independent of the ship's electric generating set, petrol lamps, candles, etc. The operator must always have ready to hand means for getting a light. A ship's lantern must be at the disposal of the operator in the wireless cabin, so that in case of need he may proceed during the night to overhaul the exterior apparatus.

Arrangements should be made that no light can, during the night, filter through to the outside, when the doors of the wireless cabin are opened. (Thick black curtains should be used or automatic light stoppers, operating as soon as the doors are opened.)

The wireless cabin shall be fitted with a ship's chronometer which must always show Greenwich mean time. (G.M.T.)

Easy and rapid access to the roof of the wireless cabin must be provided by an iron ladder so as to enable ready verification of antennæ connections, lead-in insulators, etc.

It has been observed that submarines when bombarding a vessel generally endeavour to destroy the wireless cabin at the first opportunity. These cabins are conspicuous on account of the outline formed by the insulators leading down from the antenna. It will be found an excellent precaution to hide these insulators by (*e.g.*) awnings which follow the contour of the cabin and overlap its roof.

(*c*) *Means of Communication.*—The operator must not leave the wireless cabin and abandon his listening-in, in order to receive a communication from the officer on watch, or in order to hand to him a message which he has received, or to ask for current, etc.

It is equally necessary that a third party shall not intervene in the transmission of these messages, such a course being always liable to lead to dangerous errors.

A telephone or speaking tube must therefore be erected between the wireless cabin and the bridge.

If the operators have their bunks fitted in a place apart from the wireless cabin, an electric bell shall be installed in their state room with a push in the wireless cabin, so as to give the radiotelegraphist on duty an opportunity of summoning his colleague.

If there be only a single operator, and if he sleeps in a separate cabin, an electric bell shall be installed in that cabin with a push on the bridge, so as to give the officer on watch means for calling the operator when the latter is not on duty.

All these means of communication must invariably be kept in perfect working order.

Art. 6.

Technical Conditions of Installation.

(*a*) *Erection and Fitting.*—The rapid execution of erection under present conditions must not interfere with the elementary precautions of assuring the efficient working of the wireless station and providing against risks of short-circuiting and fire.

The connections must also be carefully made by means of a flexible cable insulated by two layers of vulcanised rubber, the whole covered with lead, with an insulation resistance of at least 600 megohms per kilometre. This cable shall moreover be mechanically protected by a tube of iron or steel in every part where it is exposed to deteriorating influences.

A special line leading from the switchboard of the electric generating group shall furnish power to the wireless station. No other circuit must be connected up with this line except, in cases of emergency, a lighting circuit for the wireless cabin. Fuses must in this case be inserted in order to protect the lamp or lamps. A bi-polar interrupter and contact-breaker must be placed:

(*a*) In the machine-room, on the switch board of the electric system in the special circuit serving the wireless station.

(*b*) Within the wireless station itself in the circuit carrying the continuous current.

(*c*) Within the wireless cabin in the alternating current circuit at the ends of the alternator.

In the case of the two contact-breakers placed in the continuous feed circuit, the one on the switchboard of the electric generating system, and the other in the wireless cabin, the former must be considerably stronger than the latter in order to avoid its replacement with fusible material when faulty manipulation (or some accident to the wireless instruments) results in the melting of the fuses in the wireless cabin.

The switchboard of the wireless station shall be fitted with the necessary measuring instruments for observing the working of the machines and the wireless apparatus.

Nevertheless, it is permissible to replace continuous and alternating current voltmeters on this switchboard by pilot lamps of appropriate voltage.

The continuous current voltmeter—or the pilot lamp which takes its place—must give the operator constant opportunity for assuring himself that the generator is in working order and that there is no interruption in the circuit which feeds the wireless station.

(*b*) *Machines—Low Frequency Circuit.*—These machines and this apparatus must be very carefully insulated between the windings and between the windings and the frame. They must be submitted to a test for dielectric strength under a continuous voltage of 1,000 volts applied for five minutes when cold.

(*c*) *High Tension Apparatus.*—The insulation must have and must preserve a high degree of efficiency. This apparatus must be able to stand the following test: The sending station must be operated with the antenna circuit disconnected, and with each terminal of the secondary of the transformer earthed in turn for a period of five minutes, together with its core and metallic casing. Both machines and instruments must be effectively protected

against any excess of strain due to the high frequency circuits.

(d) *Accumulator Batteries.*—It is strictly forbidden to switch any circuit whatsoever—lighting, ventilating, etc., on to the accumulator batteries of the principal set, or on to the battery of the emergency set, or to transfer any units of the battery elsewhere; these must never be used, for instance, for lighting purposes during a temporary stoppage, etc.

The only allowable exception consists of the connecting on to the battery of the principal set—if such a source of supply be utilised for that set—a pilot lamp of 20 watts at the maximum which takes the place of a voltmeter. Any such lamp must be protected by a special double-pole fuse.

No pilot lamp may under any circumstances be fitted on the battery of the emergency set.

Operators are held personally responsible for any misuse of their batteries.

The batteries of accumulators must always be kept completely charged during the voyage. This complete charging must be effected before departure, and if necessity arises they must be re-charged every day, or every other day, according to the amount of use that has been made of them.

The accumulator switchboard must include:

(a) An ammeter showing the strength of the charging and discharging currents.

(b) A well-calibrated voltmeter connected to the terminals of the battery.

So far as the battery of the emergency set is concerned it is always permissible to omit the ammeter when the charging current is automatically limited to one or two values determined by the introduction of fixed resistances in the circuit.

Since the battery of the emergency set is very seldom at work care must be taken to ensure its maintenance in good order.

For this purpose a special apparatus must be provided for discharging the battery through a resistance.

This discharge shall be carried out at Ports of Call, and care must be taken immediately afterwards to re-charge the battery completely.

Steps shall be taken to make sure of the preservation in good order of the batteries during the periods when the ship's dynamo has stopped working.

(e) *Syntonisation.*—Regulations against sending out signals in the larger number of allied ports and in certain neutral ports plainly renders difficult a proper tuning up of the ship's station after installation.

Nevertheless, it is easy to effect an approximate syntonisation without infringing the above-mentioned regulations by simply exciting the aerial with the help of a suitable buzzer.

It is, therefore, formally recommended that this buzzer tuning method shall be used after installation, preparatory to the operation being completed after the ship has left the port. The operator will be guided in these tests by the reading of his antenna ammeter.

This syntonisation must be made for each of the two regular wavelengths (300 and 600 metres) and for each of the three antennæ, the regular, the single strand, and the emergency.

Tables clearly indicating the different tuning adjustments must be posted up in the cabin in clear view of the operator.

(f) *Plans of the Connections—Working Arrangements.*—Amongst the documents carried by the station, there must be included detailed plans of the connections of the installations and of all the apparatus, with the object of helping operators in looking for and rectifying any faults that may occur.

Radiotelegraphists must thoroughly understand the working of their station. They must practice themselves in establishing instantly, and without experimentalisation the necessary connections for bringing into action the emergency set, the emergency aerial, different wavelengths. etc.

Art. 7.

Operating Personnel.

(a) *Nationality.*—The Belgian Governmen[t] established on the 4th May, 1917, the following regulations concerning the nationality of the operating staff:—

(1) The radiotelegraphic stations of Belgian ships must be served, in principle, by operators of Belgian nationality.

(2) In default of Belgian operators the owners of stations may, at their own responsibility, and with the previous authorisation of the Belgian Government, have recourse to subjects of Allied nationality to the exclusion of neutral subjects, until they have been able, with as little delay as possible, to replace them by Belgian subjects.

(3) It is only quite exceptional that a neutral operator will, under any circumstances, be allowed to fill a post on board. A specific request must be made in advance, if need be by telegram, and the owner of the station must furnish detailed references. He will be held responsible for any acts that may be committed by this employé.

In any case, any such authorisation will be valid solely for a single trip.

Demands for emergency authorisation must, if need arise, be addressed to: The Administrator of Belgian State Telegraphs, Radiotelegraphic Service, 15, Place de l'Hôtel-de-Ville, Le Havre, France. The telegraphic address of which is: Service Radiotelegraphique Etat Belge, Le Havre.

(b) *Qualification.*—Every operator, whatever may be his nationality, in service on board Belgian ships must possess the Belgian Radiotelegraphic operating license of the first class, and have a good working knowledge of English.

(c) *Physical Qualifications.* — The special character of the service in times of war constitutes a complete bar against the employment of any operator not completely robust, or in full possession of all his limbs, or *in fine* anyone who is not physically perfect.

(d) *Disciplinary Measures.*—If an operator gives cause for any reasonable complaint on the part of the Belgian, or Allied Authorities, on the part of the owner of the ship, of the captain, of the owner of the station, etc., with regard to any misdemeanours committed in the course of the execution of his service, he may be disqualified, either temporarily or for the duration of the war, his license being suspended for the period of his disqualification. A notice thereof will be sent to the Minister of the Interior if the individual so affected proceeds to appeal. If he has been suspended without pay from his functions as Radiotelegraphist on board Belgian ships he will immediately be placed at the disposal of the military authorities.

Operators are, moreover, subject to the Disciplinary and Penal Code of the Mercantile Marine.

Art. 8.

Organisation of the Service.

(a) *Listening-in.*—During the whole length of the voyage listening-in must be completely continuous. This can only be assured by

relays of two operators in watches of four hours on and four hours off. The operator on watch may not even temporarily quit his post in case of urgent need without having been replaced by his colleague not on duty. Nevertheless, if the supply of qualified operators belonging to Belgian, or Allied nations shall be temporarily insufficient, the owner of the ship may be exceptionally authorised to have the service carried on by a single operator. This latter must in that case so organise his listening-in as to receive all the war warnings which may affect the navigation of the ship, as well as radiotelegraphic time-signals at least once in the 24 hours.

Such an authorisation as this must be applied for to the Department of Railways, Marine, Posts and Telegraphs. The person so applying must state the probable period which will elapse before he can recruit or train a second operator.

(b) *Carrying out of the Service.*—For the carrying out of the Radiotelegraphic Service operators are placed under the supreme authority of the commander of the vessel.

They are strictly forbidden to send out signals of any sort, or to answer a signal, even one of distress, without the authorisation or instructions of the officer on watch. They must never answer any station utilising the Telefunken System. No Allied vessel possesses a set of this type.

All transmission—obviously cases of distress excepted—must be made with the smallest amount of power compatible with the circumstances, so as to reduce as far as possible the zone in which the signals may be picked up by enemy sets, thus enabling them to determine the position of the ship.

All executive messages relating to navigation, as well as all distress signals, must be brought with all speed to the knowledge of the officer on watch *exactly as they stand;* the operator must never undertake to judge whether a message of this kind does, or does not, affect the navigation of his ship, the commander alone is the arbiter in such a matter.

Itinerary.—The operator on watch must make himself acquainted with the itinerary, the position and the course of the ship.

(c) *Duty in case of Distress.*—In the case of accident, explosion, etc., the operator, or operators, must immediately test their instruments to see if they are still in good working order. If the current of the ship's generator has failed they must switch on, without loss of time, the connections of the emergency set and test their antennæ. If the principal antenna be out of order, and if time presses, they must link up their gear with the emergency antenna, taking care to free it, whenever necessary, from all metal contact which may earth it, or from the principal antenna.

A trial with the auxiliary coil with direct excitation (plain aerial) will immediately inform the operator with regard to the quality and insulation of the antenna.

In a word, he must act in accordance with circumstances, so as to be able to send out his signal with the smallest possible delay; the gain of a few seconds may save the lives of all the passengers. It is only if the captain considers that sufficient time is available, and if the emergency antenna be not in sufficiently good order, that the operator may proceed to repair the principal antenna, switch on the single strand antenna, or even erect a makeshift antenna.

As soon as a set is ready to send, he must advise the captain and ask for orders, getting them *confirmed in writing*, and these orders must be followed exactly.

It is the paramount duty of the radiotelegraphist not to abandon his post so long as there is any possibility of sending or receiving; unless the commander has given him the order to do so in view of the imminent abandonment of the ship.

(d) At sea the operator must be ready at any moment to send out signals of distress with the smallest possible delay and with the maximum of energy and efficiency that the circumstances permit; he will make his arrangements accordingly. Thus for instance in the event of damage being done to the aboard-ship generator or to the principal set the emergency gear must be put into working operation.

No distress call may be radiated without the express order of the commander of the ship. It is absolutely necessary that the operator should remain collected at the critical moment of action, mishap or an attack. Upon him may depend the lives of all the passengers to say nothing of his own as well as the preservation of the ship and its freight.

He must never lose sight of the fact that it is useless to send out a distress signal without its being accompanied by the name of the ship in full and as exact an indication as possible of its position. The form of the distress call must follow strictly the instructions of the Naval Authorities in charge of all commercial ships.

Every positional error or change of position must also be radiated.

If an operator receives no answer to his distress calls he must repeat them with intervals of listening-in, and on each emission must recapitulate all the needful particulars. Should the operator conclude that his appeals are vain he should send out a new series of calls after having proceeded in the following manner. Considerably amplify the coupling between the primary oscillation circuit and that of the antenna so as to obtain an impure badly tuned and more damped emission, which stands the chance of affecting the reception of a larger number of stations and consequently of being picked up. It must be remembered, however, that the range of such an emission is less than that of a properly syntonised call. Recourse may also be had on occasions to the emergency gear with induction coil acting on a plain aerial.

Ship's Register.

(e) On every ship the operators should keep a register with numbered pages in which they will progressively enter the following particulars —showing the time in G.M.T. and the name of the operator on watch:—

(1) The start and finish of the watch of each operator as well as any interruptions, their duration and their cause.

(2) Any faults which may occur in the transmitting or reception gear, any lack of current, etc.

The nature and the cause of these mishaps must figure in the report, as well as the duration of the resulting interruption.

(3) The result of the periodic experiments conducted or some mention of the reason for which they have not been made.

(4) A record of all communications carried on with foreign stations and which did not affect their own ship.

It will suffice to make a simple record which will allow later on of these communications

being reconstituted and identified. For example:—

17 h. 53 ABC de XYZ—27 mots code mqzr dvpy....

17 h. 56 XYZ demande repetition depuis bdpz, etc., etc.

(5) The complete text of all messages received regarding the navigation of the ship and communicated to the officer on watch.

(6) All distress calls picked up.

(7) The exact text of every message sent.

(8) If possible and if stations permit, in the case of accidents enter all details relative to the execution of the radiotelegraphic service (distress calls, replies, steps taken for safety, etc.).

An operator is forbidden to enter in the steamship register any translation into plain language of a coded text. His register must, moreover, be verified and checked every day by the commander of the ship.

This register being by its nature essentially confidential must only be handed over to the Belgian and Allied authorities.

In the event of disaster operators must endeavour to save their ship's register, and if there be any risk of its falling into enemy hands they must throw it into the sea.

Account of Accident.

(*f*) In the event of its being necessary to abandon ship, or if the operator or operators are able to preserve their steamship register, they must address it to the Administration of Belgian Telegraphs at Havre through the intermediary of a Belgian Consul residing in the neighbourhood of the port at which they are disembarked. This register must not be sent by post. Whether the register has been sent or not, the operator (or operators) must in addition indite with as little delay as possible a report giving, with specific mention of dates and times, every detail relating to the execution of the radiotelegraphic service both before and after the accident (distress calls, life-saving procedure, etc.).

Mention must be made of what has happened to the ship's register, and if circumstances permit this report must be submitted by the operator, or operators, to the captain for his signature and he will make thereon any observations which he thinks fit. This document shall then be addressed by registered post to: l'Administration des Télégraphes belges Ministères belges, Le Havre (France).

Allocation of Operators.

(*g*) In the interest of the security of navigation it is well to maintain as far as possible the allocation of an operator to a specific ship or at all events to ships which ply under the same conditions, *i.e.*, between the same ports or countries.

Regard may be had for the purpose of this rule to temperaments in certain cases; for instance, it is advisable to consider the necessity of relieving operators navigating in tropic seas after long enforced idleness of a ship, or after illness, accident, leave, etc.

Confidential Character of Wireless Messages.

(*h*) Every operator must have taken the oath of observing the most absolute secrecy with regard to wireless communication under the penalty of Articles 149 and 150 of the Belgian Penal Code.

The attention of operators is expressly directed to the point that in time of war any detail relating to the radiotelegraphic service is of a character essentially confidential; every indication relative to the manner of framing and transmitting certain messages, to the presence of certain ships, to the routes followed, to convoys and their escorts, to distress calls, to sinking, etc., *in fine* everything which concerns navigation, must remain absolutely secret.

Every indiscretion coming to the ears of the enemy may have the most serious consequences.

The utmost discretion is therefore necessary, and more particularly in neutral countries and in the presence of neutral subjects—*including amongst them their wireless men.*

ART. 9.

Maintenance and Investigation.

Operators are responsible for the maintenance of radiotelegraphic installations. The commander of the ship must accord them the help of the personnel on board necessary for the investigation and upkeep of antennæ apparatus, etc.

Every part of the radiotelegraphic installation must be constantly maintained in perfect order, special care being given where such parts are subject to high tension.

Periodic Tests.

(1) Twice a day, morning and evening, a test shall be carried out of the principal transmitting set and of the emergency set in local circuit; that is to say, the antenna being disconnected. This test (signals or continuous sending) shall last for the length of time which the operator judges necessary to make sure that all is in order.

(2) Every unnecessary message is forbidden on the high seas. In order to make certain of the satisfactory working of the station (including radiation and insulation of antennæ) opportunity shall be taken at the moment of starting the voyage for proceeding rapidly and at irregular intervals to the following emission tests.

Choice must be made of a time when the traffic between neighbouring stations is small and care must be taken not to choose the hours when war warnings are being issued. These tests shall be reduced in duration to the minimum. They shall proceed as follows: (*a*) With the principal set on the principal antenna send out a call of a few seconds; the deviation of the amperemetre of the antenna will allow an operator to judge immediately if the installation be working well (it is unnecessary to keep up this sending until the needle of the apparatus becomes absolutely motionless). (*b*) With the coil of the emergency set excite the principal antenna in plain aerial; a long white spark strong and crackling will indicate that the insulation of the antenna is good, the emission of short sending will suffice. (*c*) Make the same test to verify the insulation of the emergency set.

(3) Make a daily verification of the spare detector.

In case of any parts of a machine or apparatus being found to be out of order take steps to remedy this at once. Never leave it over for later on.

ART. 10.

Spare Material—Gear.

(*a*) *Spare Material.*—The Radiotelegraphic Station must contain the following material:—

(1) A complete transmitting condenser (primary circuit) of a fixed capacity and ready for service.

(2) An aerial lead-in insulator (or a spare tube).

(3) Antenna wire, insulators and accessories in sufficient quantity for the construction of a new main antenna.

(4) A telephone with double headgear and two leads.

(5) A galvanometer for the testing of circuits.

(6) Various wires and ropes.

(7) Various accessories and spare parts, etc.

(b) *Gear and Tools.*—The operators must have at their disposal an ample supply of tools, especially such as are necessary for soldering antennæ and apparatus; their tool chest must contain *inter alia* a hydrometer for verifying the density of the accumulator electrolyte, and a portable and accurate voltmeter graduated from zero to 3 or 4 volts in order to measure the individual cell voltages.

Art. 11.

Special Arrangements.

On board ships coming under this category absolutely special precautions must be carried out.

The wireless cabin must *de rigueur* be located on the upper deck and built in such a way as to be distinct and airy; the insulation of the antennæ and of the metallic stays must, moreover, receive special attention.

Supplementary precautions may be imposed n accordance with circumstances.

Art. 12.

Various Arrangements.

Modifications to Installations.—Ship installations must not be modified without the previous assent of the Department of Railways, Marine Posts and Telegraphs.

Nevertheless, in case of partial (or total) incapacity for working, a new installation may be temporarily erected, provided that it conforms with the conditions imposed for the authorised station.

A new request for authorisation must be sent in without delay, wherein shall be set forth the necessity for having carried out any modification of the installations approved.

The licensee of a board-ship station (*i.e.*, the holder of an authorisation to instal, or of a sea-going radio license) is obliged at all times to follow the instructions given by the Department of Railways, Marine, Posts and Telegraphs, in whose control are vested all ships' stations, and to carry out within the specified times all modifications or additions which are judged necessary, not only with regard to installations and apparatus but also with regard to the manning, qualification and service of the operating personnel.

At need, the Department above mentioned shall carry out, or cause to be carried out, at the expense of the owner, all testing, repair, modification, or addition of which the execution is judged necessary to ensure good working of the installations or the safety of the ship, without any responsibility under this heading being incurred by the State.

Lifebelts.—The wireless cabin, whether or no it serves as the operators' state room, must contain for each of the radiotelegraphists a lifebelt of an efficient and approved type.

Other life-saving apparatus of the same character shall be at the disposal of operators in the places in which they are located if they do not sleep in the wireless cabin.

These life-saving appliances must be always kept in perfect order.

Art. 13.

Measures of Discipline and Control.—The officials of the Belgian Government duly appointed for that purpose have, at all times of the day or night, not only in Belgian territorial waters, but outside those waters, as well as on board Belgian vessels in foreign ports, free access to the installations of the authorised ship station and free disposal of the documents relating to the service of that station.

The owner (that is to say, the holder of an authorisation for installation or of a radiotelegraphic license) as well as his representative, employees, charterers, captains, officers, operators, masters and personnel are bound to facilitate by every means the work of supervision and control vested in these officials.

Under its controlling rights, the Department of Railways, Marine, Posts and Telegraphs may demand that the wireless register of the ship be forwarded to it.

Access to the Wireless Cabin.—Access to the wireless cabin is strictly forbidden to the personnel of the ship, except in such cases where access is necessary for the purposes of duty; and the same interdiction applies to any foreigner with the exception of the authorised naval authorities of Allied Powers.

In the absence of the radio officers, the cabin must be locked up after the windows have been closed on the inside, the key shall be handed to the commander of the ship or, in his absence, to the chief officer.

Information to be Furnished in the Requests for Authorisation Appertaining to Radiotelegraphic Stations.

Art. 14.

Applications to be sent, under registered cover, to the Minister of Belgian Railways, Marine, Posts and Telegraphs, at Sainte-Adresse, Seine-Inf rieure, France.

(a) *Where a Ship is not already furnished with Wireless*:—

Application.—Social status, name, Christian names; address in Belgium; present address.

Ship.—Name, method of propulsion (steamer, sailing vessel, motor launch), net tonnage, speed, business, itinerary, whether carrying passengers regularly or occasionally; whether on occasion freighted with volatile and inflammable goods.

System of Apparatus.—What system of apparatus do you purpose installing on board your ship? Name and address of the supplier of the installation and apparatus. Name and address of the exploiter of the station.

Nature of the Installations.—Here give a description of the various parts and arrangements of the proposed installation, with plans or the connections and apparatus.

[N.B.—Descriptions and plans must be of such a character as to indicate whether the proposed installations conform to the prescribed conditions.]

The power available at the terminals of the wireless alternator (voltage and current), frequency of current.

Number of sparks per second.

Minimum range by day of the stations as estimated by the supplier.

Constitution of the emergency set.

Accumulator battery of the emergency set, number of cells, type, voltage, capacity, in ampere-hours.

Does the sending set include a battery of accumulators?

Number of cells, voltage capacity in ampere-hours.

Antennæ.—The form and approximate dimensions of the main antenna. How is it proposed to instal the emergency antenna? Where will it be fixed? Its shape and approximate dimensions.

Electric Generating System.—If an electric generating system exists on board, show what kind of motor it carries (steam, petrol, etc.).

Power, voltage, and method of excitation for the dynamo.

The power available for feeding the wireless station.

Where is this electric generating system located?

If it is necessary to instal a special electric generating system:—

Name and address of the firm which supply it.

A description and plan of the system, type of motor (steam, petrol, etc.).

Power, voltage and method of exciting the dynamo.

Erection of the Station.—Where is it planned to instal:—

(a) The wireless cabin (are you constructing a special cabin or are you adapting one already existing)? On what deck? In what place? (Here add a plan and elevation.)

(b) The accumulator battery.

(c) The electric generating system (if a separate system is necessary).

(d) Operators' quarters.

Operating Personnel.—What qualified persons have you available to work your station?

Time for Erection.—How long a period do your suppliers need for the delivery of the material and for installing it on board your vessel?

About what time and in what port will this installation be set up?

The Proposed Signalling Arrangements.—Call letters—normal range in nautical miles. Wireless system and the character of emission. Wavelengths. Nature of services. Hours of service.

Board-ship charges: per word in francs.

Board-ship charges: minimum per radiotelegram in francs.

(b) Where a vessel is already furnished with a wireless station that requires modification or completion in conformity with the stipulations of the present regulation.

Applicant.—Social status, name and Christian names; address in Belgium; present address.

Ship.—Name, method of propulsion (whether steamer, sailing boat or motor-launch), net tonnage, speed, nature of traffic, itinerary; whether it regularly or occasionally carries passengers; whether on occasion freighted with volatile and inflammable articles.

System of Apparatus.—What is the system of apparatus installed on board your ship? Name and address of the supplier and of the installer of this apparatus. Name and address of the exploiter of the station.

Nature of the Installations.—Add a description of the various parts and make-up of the existing installation with a plan of its connections and apparatus.

What are the modifications you propose introducing to put it in accord with the conditions of the present regulation?

N.B.—Descriptions and plans must allow of its being seen whether the installation and proposed modifications are in conformity with the new conditions laid down.]

Power available at the terminals of the alternator (voltage and current); frequency of the current.

Number of sparks per second.

Minimum range by day of the existing station.

Is there an emergency set? What is its constitution?

The accumulator battery of the emergency set, the number of cells, type, voltage, and capacity in ampere-hours.

Does the principal set include an accumulator battery?

Number of cells, type, voltage, and capacity in ampere-hours.

Antennæ.—Form and dimensions of the principal antenna.

How is it proposed to instal the emergency antenna?

Where will it be fixed? The form and approximate dimensions thereof.

Electric Generating System.—What sort o motor does it carry (steam, petrol, etc.)?

Power, voltage and method of exciting the dynamo.

What is the power available for feeding the wireless installation?

Is the electric generating set installed to serve solely the wireless station? Or is it to supply the lighting of the ship, electric motor-pumps, ventilators, etc.?

Where is the electric generating system nstalled? On what deck?

Location of the Station.—Where is it proposed to instal:

(a) The wireless cabin: on what deck? at what point? (Include here diagrams in plan and elevation.)

(b) The accumulator battery of the emergency set, as well as that of the principal transmitting set (if it carries one)?

(c) Operators' quarters?

Operating Staff.—What qualified persons have you at your disposal for working the station?

If you have on board only a single Belgian operator, how soon can you arrange to have the station worked by a second Belgian radiotelegraphist, or provisionally by one of Allied nationality?

Time Occupied by the Modifications.—How long do you estimate your suppliers and workers will take in modifying and completing your installations to accord with the conditions of this new regulation?

About what date and in what port will these modifications probably be carried out?

F APPLICATION OF THE DECREE OF THE 10TH SEPTEMBER, 1918, RELATIVE TO SHIPS' LICENSES.

Circular No. 1.

The attention of shipowners is directed to the fact that in pursuance of Article V of the Decree of the 10th September, 1918, relating to shipping licenses, Belgian vessels of 1,500 tons or over must be fitted with a radiotelegraphic station for the transmission and reception of ether messages through the agency of a competent personnel. The erection of these stations, their constitution, their operation, their supervision, etc., are regulated by international agreements and by Belgian laws and regulations in matters of radiotelegraphy.

With as little delay as possible, and at latest before the 15th November, 1918, every owner of a vessel liable to the above-mentioned obligation must, in conformity with Article I of the Royal Decree of November, 1913, deposit

under registered cover, addressed to the Department of Railways, Marine, Posts and Telegraphs of the Belgian State, located at Sainte-Adresse, Seine Inferieure, France, a request for authorisation to instal a radiotelegraphic station.

ONE SEPARATE REQUEST MUST BE MADE FOR EACH VESSEL.

Directions with regard to the particulars necessary to be furnished in such requests for authorisation will be found at the close of the administrative regulations affecting wireless telegraphy, dated 15th October, 1918.

The Department of Railways, Marine, Posts and Telegraphs, having regard to national interests and to the arrangements concerning apparatus and operators, shall settle the order in which vessels shall be fitted with their radiotelegraphic station and shall assign to each one of them the date at which it shall be completely installed and in a perfect condition for working.

The attention of shipowners is specially directed to the conditions of Articles 1 and 2 of the Royal Decree of the 3rd November, 1919, which will be very strictly enforced. The authorisation for making installations must be obtained before any measure can be taken by the interested parties with the object of initiating the work.

A radiotelegraphic license shall be granted to the owner of a vessel when the installations have been recognised as conforming to the conditions imposed. This license will be granted for one or several voyages, or for a certain fixed period. It will be cancelled if it be established at any moment that the installations have not been set up and worked in accordance with the conditions stipulated in the licence or in a later regulation.

The licensee (one who benefits under an authorisation for a wireless installation or of a radiotelegraphic license) shall be bound at all times to follow the instructions given him by the Department of Railways, Marine, Posts and Telegraphs, and must carry out within the specified period all modifications or additions which are judged necessary, both with regard to installations and apparatus, so far as concerns its material, and the qualification and service of the operating staff.

Whenever needful the above-mentioned Department shall initiate, or shall cause to be initiated, at the cost of the licensee, any verification, repair, modification or addition which may be judged necessary to ensure the satisfactory working of the installations or the security of the ship without involving any responsibility therefore on the part of the State.

Except with special permission previously obtained, board-ship stations must be worked by specialised operators of Belgian nationality.

Telegraph Administration.

No. 1665 R.

Dated at Havre, 21st October, 1918.

CIRCULAR LETTER TO SHIPOWNERS WHOSE VESSELS ARE ALREADY FITTED WITH A RADIOTELEGRAPHIC STATION.

GENTLEMEN.—Article V of the Decree of the 10th September, 1918, relating to ships' licenses makes the granting of these permits subject to certain conditions affecting the manning and conditioning of the ship.

The Circular No. 1 addressed to shipowners has brought to your notice that, in conformity with Article V above, every Belgian seagoing vessel above 1,500 tons net must be fitted with a radiotelegraphic station in charge of a competent staff.

You will have found annexed to the Circular in question the text of certain arrangements which regulate the erection, working and conduct of the stations.

The Decree shall come into force on the 15th October, 1918. A certain amount of delay will be allowed you for modifying the radiotelegraphic installations already in existence on board Belgian vessels and to complete the engagement of the operating staff in accordance with the stipulations of the Belgian administrative regulations with regard to radiotelegraphy under date of the 15th October, 1918.

On the expiry of these delays all wireless authorisations or licenses issued previously will expire and be cancelled.

Kindly forward with as little delay as possible and at latest by the 15th November, 1918, under registered cover, addressed to the Department of Railways, Marine, Posts and Telegraphs, located at Sainte-Adresse, Seine Inferieure, France, a fresh request for authorisation with regard to radiotelegraphy. *A separate request must be made for each ship.*

Directions as to particulars you are required to furnish in your request for authorisation will be found at the close of the Administrative Regulations dated 15th October, 1918.

After examining your request I will let you know the length of time granted you for installing and working your present station under the rules newly imposed.

A fresh radiotelegraphic license will be granted to the ship as soon as we have verified that these conditions are fulfilled.

In order to guard against mistakes and loss of time, all correspondence relating to radiotelegraphic installations (requests for particulars, personnel, licenses, etc.) must be addressed directly to:

Service de Radiotélégraphie de l'Etat Belge
Administration des Télégraphes,
15, Place de l'Hôtel de Ville,
LE HAVRE (France);

and telegrams to:

Service Radiotélégraphique Etat Belge
LE HAVRE (France).

Please acknowledge receipt of this letter.

Your obedient servant,

(Sgd.) Belgian Inspector-General of Telegraphs for Minister of Marine, Posts and Telegraphs.

MINISTERIAL DECREE REGARDING AMATEUR WIRELESS INSTALLATIONS.

THE MINISTER OF RAILWAY, MARINE, POSTS AND TELEGRAPHS.

DECREES:

The conditions regulating the establishment and the working of receiving wireless stations are fixed in accordance with the following:—

ART. 1.—Requests for authorisation must be addressed to the Director-General of Telegraphs and Telephones at Brussels.

The person making the request must indicate the precise place and functions of the proposed station and must furnish for approval a description of the apparatus.

The applicant must prove if such should be the case that he is of Belgian nationality.

ART. 2.—Authorisation is granted:—

(*a*) By the Director-General of Telegraphs and Telephones when the applicant be of Belgian nationality.

(*b*) By the Minister of Railways, Marine, Posts and Telegraphs to whom the request

should be transmitted by the Director-General with his advice, if the applicant be a foreign subject.

Art. 3.—The station authorised will be utilised exclusively for reception of time and weather signals; the transmission of any other electrical signal is formally prohibited.

The use of amplifying valves is not allowed. However, the Administration of Telegraphs and Telephones may, in certain particular cases, which must be submitted for approval and after enquiry and examination of the reasons given by the applicant, grant an authorisation to use such apparatus under conditions to be determined by the Administration.

Art. 4.—Under the penalty of immediate withdrawal of the authorisation, the applicant must scrupulously observe, and cause others to so observe, the secrecy of any information which is not intended for public use.

The contents of radiotelegrams other than meteorological telegrams which will eventually be received by the Postal Authorities, must be neither written nor divulged to anyone outside the officials appointed by the Administration of Telegraphs and Telephones, or of the judicial authority. The withdrawal of the authorisation as a result of a contravention of this Law, will be eventually carried out without prejudice to the applicant of any punishment provided for by Law.

Art. 5.—The applicant is forbidden to receive any payment or remuneration whatsoever for the reception of information by means of the station authorised.

Art. 6.—The Government reserves to itself the right to examine installations authorised. When necessary the applicant will grant to the duly commissioned delegates of the Government free access to the said installations, and will facilitate by every means in his power such examination by the delegates.

Art. 7.—The applicant alone is responsible for all consequences whatsoever, resulting from the present authorisation, not only from the point of view of mistakes which may be made, but also in regard to all matters connected with patent rights or of any other rights of a third party. The responsibility of the State is, and will remain, entirely separate in connection with the present authorisation.

Art. 8.—The applicant is held responsible for notifying the Director-General of Telegraphs and Telephones of all alterations which he proposes to make to his apparatus. This must not be changed without the previously obtained consent of the Administration of Telegraphs and Telephones.

This administration may, however, at any time, and for whatever cause, suspend or revoke the authorisations granted, without the payment of any indemnity whatsoever, or without giving any reason for such suspension or revocation.

This permission neither includes any privilege either for this particular authorisation or for any subsequent authorisation of the same nature.

It is not transferable without the express permission in writing of the Administration of Telegraphs and Telephones.

At the request of the Administration of Telegraphs and Telephones the applicant must immediately place his apparatus out of working order.

Art. 9.—The applicant must hold himself responsible for all expenses and charges whatsoever, occasioned by permission granted to him.

Art. 10.—The applicant will pay a fixed annual fee of 20 francs for every authorised receiving station.

The first payment will be made before obtaining the authorisation; it will cover the remainder of any year from the day of the authorisation to the following December 31st.

Subsequent fees will be paid during the month of January of each year No refund will be made by the Treasury no matter for what reason the use of the apparatus previously authorised be discontinued.

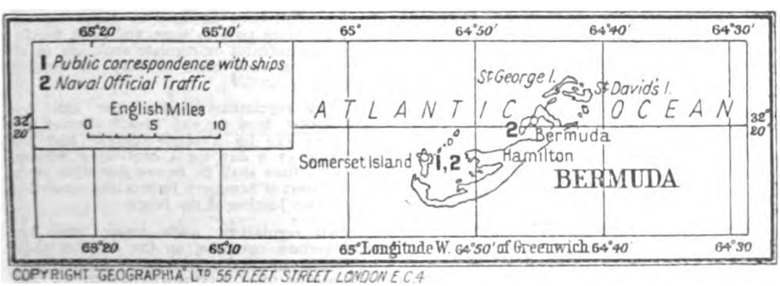
This applies equally in the case of the station being discontinued by order of the Administration of Telegraphs and Telephones.

Art. 11.—Stamp Duties and subsequent Registration Fees will be charged to the applicant.

Done at Brussels, *August 7th*, 1920.
(*Signed*) P. Poullet,
The Minister.

BERMUDAS (THE)

A BRITISH Colony with representative Government, consisting of a group of 360 small islands (about 20 inhabited) the Bermudas are 520 miles east of North Carolina and 677 distant from New York. They are noted for their climate and scenery and constitute a favourite winter resort for Americans. The area is a little under 20 square miles, and the capital city is Hamilton.



Bermuda Dockyard open for public general correspondence.

ADMINISTRATION.

There are two wireless stations working in the Colony. Wireless telegraphy is administered under the following enactments :—

A—The Wireless Telegraph Act, 1903.
B—The Wireless Telegraph Act, 1909.

The Wireless Telegraph Act, 1903.

A From and after the passing of this Act it shall not be lawful for any person in these islands to transmit or receive messages across the seas (*by an Act of* 1910 *this was amended by the addition of the words* "*or between places in these islands*") by means of any wireless telegraph, or to instal, erect, construct, establish, or maintain in these islands any instrument, apparatus, or other thing for the purpose of transmitting or receiving such messages, unless such person shall hold a written license from the Governor authorising the same, and such license shall be in force and unrevoked; and any person who shall offend against the provisions of this enactment shall be liable, on summary conviction before any two justices, for a first offence to a penalty not exceeding £25, and for a second or subsequent offence to a penalty not exceeding £100.

2. Any license issued by the Governor under this Act may at any time be revoked by him by a written notice given to the person to whom such license was issued, or by the publication of such revocation in the *Gazette*, and after such revocation such person shall not be entitled to any privilege or protection by virtue of such license.

3. Any license under this Act may be issued subject to such conditions and restrictions as the Governor may from time to time consider desirable in the public interest.

4. If any Justice of the Peace shall be satisfied from the information on oath of any credible person that there is good reason to believe that any of the provisions of the first section of this Act have been or are being violated, he may issue a search warrant to any constable or constables authorising and requiring him or them, with or without assistants, at any hour of the day or night to enter into, and go through and search, inspect and examine any premises where such violation is suspected to have been or to be committed for the purpose of ascertaining whether such violation has been or is being committed; and if, upon such search, any instrument, apparatus, or other thing apparently used, or capable of being used, for the purpose of transmitting or receiving messages across the sea by wireless telegraphy shall be found, it shall be lawful for such constable or constables to seize and carry away, or otherwise to secure the same; and if, upon a hearing before any two Justices of the Peace, they shall adjudge and determine that any such instrument, apparatus, or other thing, has been used, or is capable of being used, for either of the purposes aforesaid, they may adjudge the same to be forfeited, and such forfeiture may be in addition to any penalty which may be imposed on any person under this Act in respect of such instrument, apparatus, or other thing.

5. Any instrument, apparatus, or other thing which shall be adjudged to be forfeited under the provisions of this Act shall be sold or otherwise disposed of in such manner as the Governor shall direct, and if sold the net proceeds of such sale shall be paid into the public treasury, after payment thereout of such reward, if any, as the Governor shall award to the informer, or to any constable or constables executing the search-warrant under which such articles were seized.

6. This Act shall continue in force until and throughout the last day of December, 1907. (*By the Wireless Telegraphy Act Continuing Act*, 1907, *the Act of* 1903 *is continued in force indefinitely*.)

The Wireless Telegraph Act, 1909.

B The Governor having informed the Legislature that a despatch has been received from the Secretary of State for the Colonies drawing attention to the desirability of making Regulations as to the use of Wireless Telegraphy apparatus on merchant ships, whether British or foreign, while in the territorial waters of these islands, is was deemed expedient to confer on the Governor in Council the power to make such Regulations as may be necessary for the purpose aforesaid, and the following Act came into force in March, 1909 :—

1. It shall be lawful for the Governor in Council to make regulations as to the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in the territorial waters of these islands, for preventing such apparatus being worked so as to interfere with naval signalling, or with the working of any wireless telegraph station lawfully established or worked in these islands, or with the transmission of messages between any such station and ships at sea.

2. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships, whilst in the territorial waters of these islands shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases, or in such cases as may be deemed desirable.

3. Any regulations made under this Act may impose fines for any breach thereof not exceeding £20 for a single offence, and not exceeding £5 a day for a continuing offence, and such fines shall be recoverable with costs in any Court of Summary Jurisdiction consisting of any two Justices of the Peace.

4. All regulations made under this Act shall become operative on the date of their publication in the *Gazette*, or on such later date as shall be fixed by the regulations for the purpose.

BOLIVIA

THIS State possesses no seaboard, and, therefore, no maritime stations. The total area of the Republic is reckoned at 703,421 square miles. Geographically it lies between latitude 8° and 23° S., its longitude extending from 57° 30′ to 73° W. The population is estimated at about two and a half millions. Lake Titicaca, a wonderful stretch of water, about 150 miles in length and breadth and 12,545 feet above the level of the sea, marks the boundary between Bolivia and Peru, and still forms an important means of communication between the countries, although the most direct means of transit consists of the railway between Arica (Peru) and La Paz, the capital of Bolivia.

The Government consists of a President, two Vice-Presidents and five Ministers of State.

CONTROL.

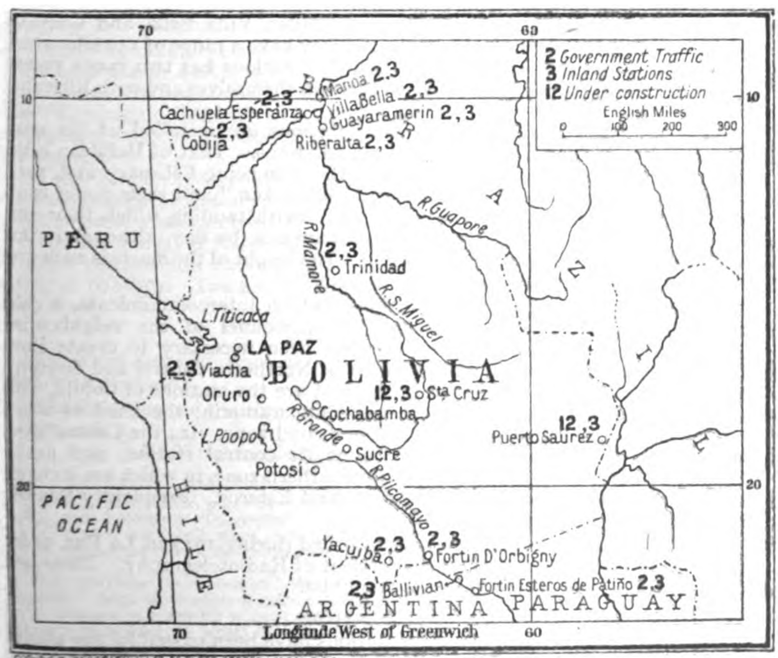
Wireless telegraphy forms at present a branch of the Posts and Telegraphs, which is administered by the State.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. Abdon Saavedra ..	Minister of Government and Public Works	La Paz
Mr. R. Villalobos	Director-General of Posts and Telegraphs	La Paz
Mr. Humberto Asin ..	Chief of Radiotelegraphic Service	La Paz

ORGANISATION.

Bolivia entered the International Telegraphic Convention on June 1st, 1907, in the fourth category, and gave in its adherence to the International Radiotelegraphic Convention on October 29th, 1915.



At present the following stations are in operation: The station of Viacha, which owing to its proximity to the capital is the first or central station of the Republic. The power is 15 kilowatts, it has four masts of 80 metres each, the working range is 1,200 kilometres during the day, it communicates with the Peruvian stations of Lima and Cachendo, and with the Bolivian stations of Riberalta, Yacuiba, Trinidad, whilst its communications are received at all offices of the Republic. The apparatus was supplied by the Marconi Company, and the service was inaugurated on the 20th October, 1916.

The station of Riberalta, installed by the Marconi Company, has the same power, the same height and number of masts, etc., as that of Viacha, communicating with the Brazilian stations of Porto Velho, Sena Madureira, the Peruvian stations of Yquitos and Cachendo, and the Bolivian stations of Viacha, Cobija, Trinidad, Villa Bella, Cachuela Esperanza and Guayaramerin; the station has been in operation since October, 1915.

The station of Yacuiba, also, is of the same type as the two previous ones. The work was commenced by engineers of the Marconi Company, and was concluded in August, 1915. Its service with foreign nations is with Asuncion (Paraguay), and it also communicates with Antofogasta (Chile), but its principal aim is to communicate with the stations known as the Pilcomayo stations, so named from their being situated on the banks of that river.

The other stations in order of importance are as follows: Trinidad, the power of which is 6 kilowatts, and system "Telefunken," has a mast 80 metres high, and communicates with the stations of Viacha and Riberalta. It was installed in 1919.

Cobija.—The service of this station was inaugurated on May 4th, 1919; it communicates with Riberalta and the Brazilian station of Xapury. Its power is 5 kilowatts, and it is fitted with a mast 80 metres high. The apparatus was supplied by the Marconi Company.

The stations of Cachuela Esperanza, Manoa, Villa Bella and Guayaramerin are of the "Telefunken" system. They have a range of 150 kilometres, their power is 4 kilowatts, and each of these stations has two masts twenty metres in height. They communicate between themselves and with Riberalta, and were opened in January, 1920.

The stations called the Pilcomayo stations are installed at the small military forts of Ballivian, D'Orbigny and Esteros. That of Ballivian is the first which was installed in the Republic, the date being February 21st, 1914. The system of the three stations is the "Telefunken," and their power is 0·6 (six-tenths of a kilowatt) in the primary, notwithstanding which they communicate perfectly at a distance of 380 kilometres, by day, although in that district there is 90 per cent. of high wood. The height of the masts is 20 metres each, there being two masts to each station.

At each of the 15 kilowatt stations, which intercommunicate, a chief has been appointed who supervises the personnel of the neighbouring stations of lesser power, for which it has been necessary to create three divisions, which have received the names of Northern, Central and Southern Radiotelegraph Zones. Included in the first are the stations of Cobija, Villa Bella, Cachuela Esperanza, Manoa and Guayaramerin, the chief of which stations is stationed at Riberalta; to the second zone, viz., the Central zone, belongs only Trinidad, having Viacha as its central station, and finally Yacuiba which is the chief station of the Southern zone, in which are included the stations of Ballivian, Fort D'Orbigny and Esteros. Frequently this last mentioned zone is called the Chaco zone.

A radiotelegraphic school was established during 1917 in La Paz, under the dirction of Mr. Asin, the Superintendent of Radiotelegraphy. There are no wireless clubs or societies in the Republic.

ADMINISTRATION.

At present no special laws or regulations have been passed for the administration of wireless, but a Bill for that purpose is in course of being drafted.

BORNEO (BRITISH)

Protectorate of Sarawak

THE territory of Sarawak comprises an area of about 50,000 square miles, with a population of about 600,000, composed of various races. It is situated on the north-west coast of the Island of Borneo, is intersected by many rivers, some of which are navigable for a considerable distance inland, and commands about 400 miles of coast line. The romantic story of how the present hereditary dynasty was initiated under Sir James Brooke, first Rajah of Sarawak, in 1842, is too well known to need repetition. The administration is conducted by the Rajah, Charles Vyner Brooke, assisted by a Supreme Council and a General Council in Kuching, and an Advisory Council in London. The Civil Service is composed of British officers selected by the Rajah. Sarawak is a British Protectorate.

CONTROL.

The Radiotelegraph and Telephone Department is a separate unit from the Post Office, and is in the sole charge of the manager, who deals in all matters relating to the wireless telegraph and telephone service.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. J. R. Barnes	Manager	Kuching.
Mr. L. I. Warder	Assistant	Do.
Mr. P. E. Cox	Assistant Engineer	Do.
Mr. C. S. Were	Operator	Do.
Mr. H. G. Gray	Operator	Do.

ORGANISATION.

Radio communication was instituted by the Government for public and official use in April, 1917. The chief station is at Kuching, the capital of Sarawak. Sub-stations are situate at Miri, Sibu, Sadong and Goebilt. The "Compagnie Général de Radiotélégraphie, Paris," system is employed throughout, except at Goebilt, which was constructed locally by the department.

There is one experimental station belonging to the manager at Kuching; other experimental stations are allowed, provided the transmitter wavelength does not exceed 400 metres.

The Kuching, Miri and Sibu stations are open daily for communication on 1,800 metres, and Sadong and Goebilt on 600 metres. All stations are also open to ships. The general hours of working are from 8 a.m. to 6 p.m., local time.

ADMINISTRATION.

There are no regulations obliging ships trading in Sarawak waters to be fitted with wireless.

The following are the Regulations relating to wireless in the Protectorate of Sarawak.

A—Wireless Telegraphy Order, 1921.

ORDER, No. XIX, 1921.

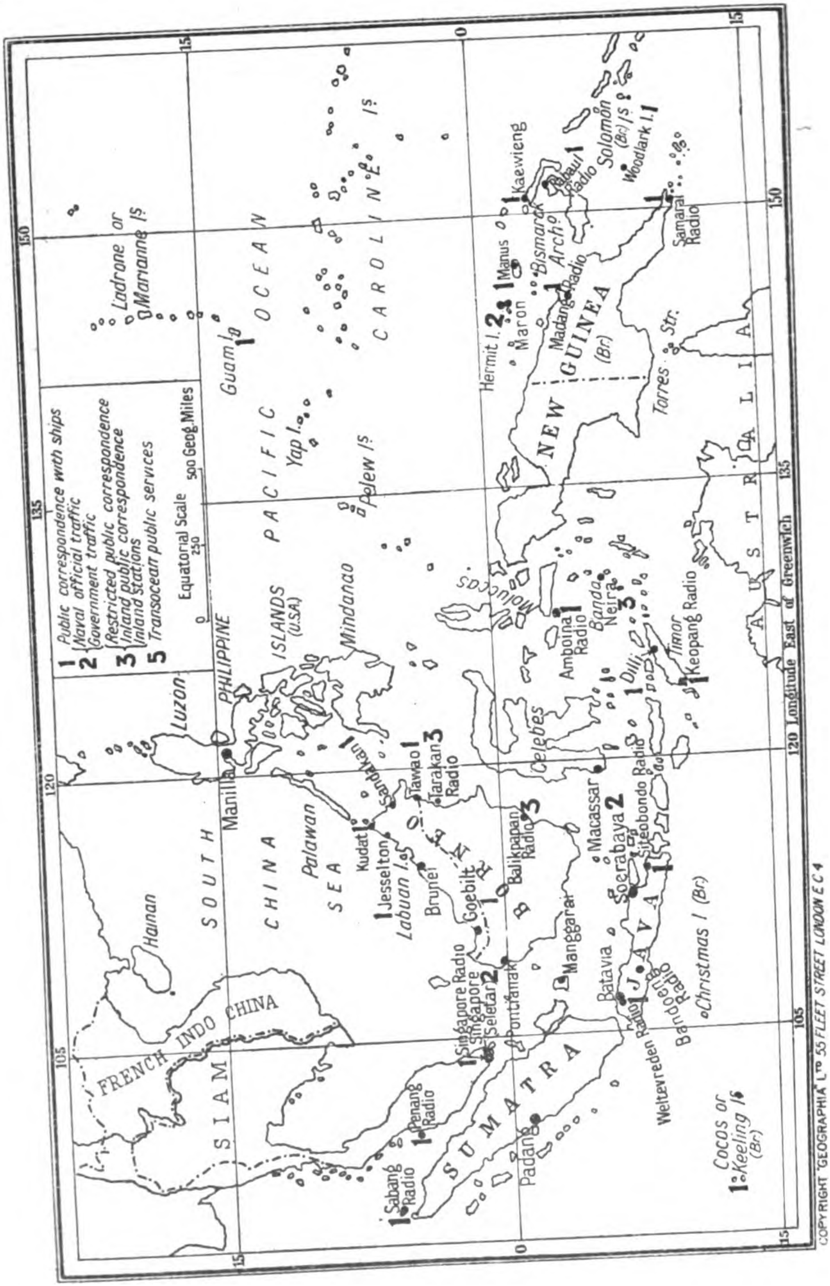
A 1. This Order may be cited as the "Wireless Telegraphy Order, 1921," and shall come into force upon the publication thereof in the *Government Gazette*.

2. (i) In this Order the expression "Wireless Telegraphy" means any system of communication by telegraph or telephone without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

(ii) Nothing in this Order shall prevent any person from making or using apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. His Highness the Rajah, whenever he shall deem it expedient so to do, may license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in Sarawak or on board any ship registered in Sarawak.

4. (i) No person shall erect or establish


1 Public correspondence with ships
2 Naval official traffic
Government traffic
3 Restricted public correspondence
Inland public correspondence
Inland Stations
5 Transocean public services
Equatorial Scale
0 250 500 Geog. Miles
PACIFIC OCEAN
SOUTH CHINA SEA
PHILIPPINE ISLANDS (U.S.A.)
CAROLINE IS.
Ladrone or Marianne IS.
Guam I.
Yap I.
Pelew IS.
Luzon
Mindanao
Manilla
Palawan
Hainan
FRENCH INDO CHINA
SIAM
SUMATRA
JAVA
BORNEO
Celebes
Moluccas
NEW GUINEA (Br.)
AUSTRALIA
Torres Str.
Bismarck Arch.
Solomon (Br.) IS.
Woodlark I.
Kaewieng
Rabaul Radio
Manus
Maron
Hermit I.
Madang Radio
Samarai Radio
Amboina Radio
Banda Neira
Dilli
Timor
Keopang Radio
Macassar
Soerabaya
Siteobondo Radio
Tarakan Radio
Tawao
Sandakan
Kudat
Jesselton
Labuan I.
Brunei
Goebilt
Balikpapan Radio
Manggarai
Batavia
Bandoeng Radio
Weltevreden Radio
Christmas I (Br.)
Cocos or Keeling IS. (Br.)
Singapore Radio
Singapore
Seletar
Pontianak
Penang Radio
Sabang Radio
Padang
120 Longitude East of Greenwich
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any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in Sarawak except under and in accordance with a license granted by His Highness the Rajah.

(ii) Every such license shall be in such form and for such period as His Highness the Rajah may determine, and shall contain such terms, conditions and restrictions on and subject to which the license is granted as His Highness the Rajah shall consider desirable in the public interest.

5. (i) If any person erects or establishes a wireless telegraph station without a license in that behalf or instals or works any apparatus for wireless telegraphy without a license in that behalf, he shall be liable to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Order except with the previous sanction of His Highness the Rajah.

(ii) On being satisfied by information that there is reasonable ground for believing that a wireless telegraph station has been erected or established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf, a Judge of the Supreme Court or Police Magistrate or District Officer may grant a search warrant to any police officer to enter and inspect the station, place, or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. The regulations in the schedule to this Order shall have effect except in so far as they may be amended or rescinded by further regulations made by His Highness the Rajah for carrying into effect the purposes of this Order.

7. (i) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Order or of any regulation made thereunder, or in breach of the conditions and restrictions subject to or upon which any license has been issued, shall be deemed to be an offence against this Order, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(2) All convictions, forfeitures and fines under this Order or any regulations made thereunder, may be had and recovered before a Resident's Court.

THE SCHEDULE.

(1) All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the State shall be worked in such a way as not to interfere with the working of any wireless telegraphy station lawfully established, installed or worked in the State or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is any harbour of the State except with the special or general permission of His Highness the Rajah.

(3) These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

By Order of His Highness the RAJAH.

British North Borneo

British North Borneo occupies the northern part of the Island of Borneo. The interior is mountainous, Mount Kinabalu being 13,455 feet high, but most of the surface is jungle. Total area 31,106 square miles; coast line 900 miles.

The territory is under the jurisdiction of the British North Borneo Company, being held under grants from the Sultans of Brunei and Sulu (Royal Charter in 1881). The territory is administered by a Governor (appointed with the approval of the Secretary of State) in Borneo and a Court of Directors in London, appointed under the Charter. On May 12th, 1888, the British Government proclaimed a formal protectorate over the State of North Borneo.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPH OPERATORS.

Official.	*Title.*	*Address.*
Mr. C. F. Newton Wade, A.M.I.R.E.	Postmaster-General and Superintendent of Telegraphs	Jesselton.
Mr. H. A. Dabell	Assistant Postmaster and Assistant Superintendent of Telegraphs	Sandakan.

ORGANISATION.

Radiotelegraph intercommunication is maintained by four 5-kilowatt Government stations situated at Jesselton, Sandakan, Kudat and Tawau respectively. The Siemens Quenched Spark system is employed throughout. The Sandakan station was the first erected in the State and completed in

October, 1913. The conditions of working are, as in most tropical countries, not altogether good, owing to the strong electrical disturbances and the mountainous country which is covered with dense jungle. The four stations have, however, maintained an uninterrupted day service since their erection.

ADMINISTRATION.

Wireless telegraphy is administered in accordance with the provisions of the following ordinance:—

A—Wireless Telegraphy Proclamation, 1914.

WIRELESS TELEGRAPHY PROCLAMATION, 1914.

As British North Borneo has been included as a party in the International Radiotelegraphic Convention.

The following proclamation controls the use of wireless telegraphy:—

1. This proclamation may be cited as "The Wireless Telegraphy Proclamation, 1914," and shall come into force upon the publication thereof in the *Gazette*.

2. (i) In this proclamation the expression "wireless telegraphy" means any system of communication by telegraph as defined by "The Telegraph Proclamation, 1901," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received;

The expression "locally owned ship" means a ship owned wholly by the Government or by bodies corporate established under and subject to the laws of this State, and having their principal place of business within this State.

(ii) Nothing in this proclamation shall prevent any person from making or using apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may, whenever he shall deem it expedient to do so, license the establishment of any wireless telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in this State or on board any locally owned ship.

4. (i) No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place in this State or on board any locally owned ship except under and in accordance with a license granted in that behalf by the Governor.

(ii) Every such license shall be in such form and for such periods as the Governor may determine, and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

5. (i) Any person establishing a wireless telegraphy station without a license in that behalf, or installing or working any apparatus for wireless telegraphy without a license in that behalf, shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, provided that no proceedings shall be taken against any person under the proclamation except with the previous sanction of the Governor.

(ii) On being satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf, a magistrate may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (i) The Governor may make and, when made, vary or cancel rules more particularly for all or any of the following matters:—

(*a*) For prescribing the form and manner in which applications for licenses under the proclamation are to be made;

(*b*) For prescribing the fees payable on the grant of any license;

(*c*) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship or a British or a foreign ship, in the waters of this State shall be worked so as to prevent the interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in this State or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(*d*) For prohibiting, except with the special or general permission of the Superintendent of Telegraphs, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship or a British or a foreign ship, whilst such ship is in any of the harbours of this State;

(*e*) For prohibiting or regulating, in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether locally owned ships or British or foreign ships, in the waters of this State, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time, either in all cases or in such cases as may be deemed desirable;

(*f*) And generally for the more effectual carrying out of the provisions of this proclamation.

(ii) No rules made in respect of the matters described in paragraphs (*c*), (*d*), and (*e*) of sub-section (i) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. On an application for a license proving to the satisfaction of the Governor that the whole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted to such applicant, subject to such

special terms, conditions, and restrictions as the Governor may think proper that such license shall not be subject to any rent or royalty.

8. (i) Every omission or neglect to comply with, and every act done or attempted to be done contrary to, the provisions of the proclamation, or of any rule made thereunder, or in breach of the conditions and restrictions subject to or upon which any license has been issued, shall be deemed to be an offence against, not otherwise specially provided for, the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(ii) All convictions, forfeitures, and fines under this proclamation, or any rules made thereunder, may be had and recovered before the Court of a Magistrate of the First Class.

BRAZIL

THE great Republic of Brazil extends on both sides of the Equator. With regard to latitude it stretches between 4° 22′ N. and 33° 45′ S., whilst with regard to longitude it lies within the limit of 34° 40′ and 73° 15′ W. It covers an area estimated at 3,298,870 square miles, and abounds in natural wealth of every description. Originally a colony of " Britain's oldest ally," the most cordial relationship between Brazilians and British is traditional with both nations.

CONTROL.

The radiotelegraphic stations of the country are exclusively under the control of the Government, and their administration is regulated by the Minister of Public Works with respect to installations of a civil character, and by the Ministers of State for War and the Navy with respect to installations destined for national defence and the services of the military and naval forces.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Dr. Pires do Rio	Minister of Public Works	Ministerio da Viacao.
Dr. Antonio Nogueira Penido	Director-General of Telegraphs	Reparticao Geral dos Telegraphes.
Dr. Francisco Bhering ..	Sub-Director Technical Department ..	Do.
Dr. Ferreira Chaves ..	Minister of Marine	Ministerio da Marinha
Admiral Max de Frontin ..	Chief Naval Staff	Do.
Capt. Tenente Mario do Barros Barreto	Chief Naval Radio Service	Do.
Dr. Pandia Calogeras ..	Minister of War	Ministerio da Guerra.
Lt. Aranha de Vasconcellos	Chief of Army Radio Service	—

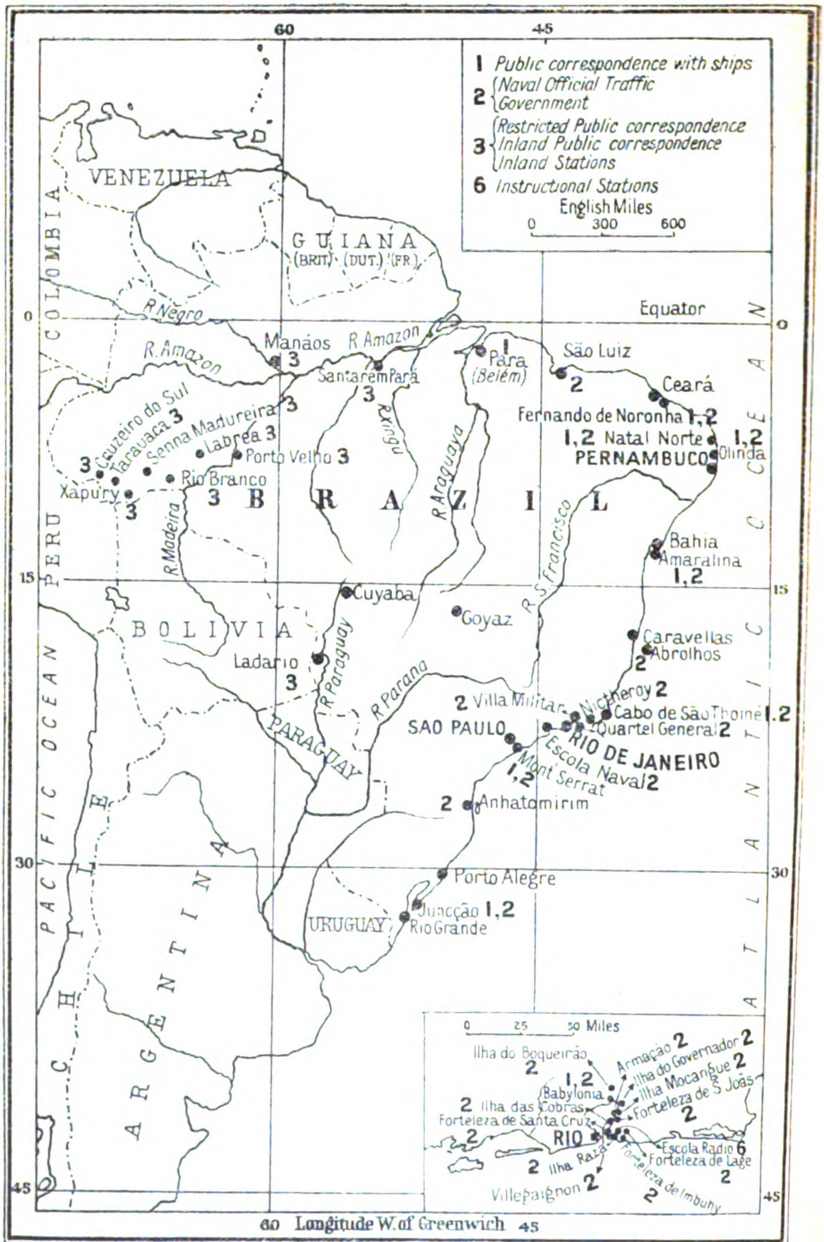
By Decree No. 13124 of August 7th, 1918, stations under the Ministry of Public Works were transferred to the Ministry of Marine for War purposes, but it has been arranged for these stations to revert to the Ministry of Public Works.

ORGANISATION.

The radiotelegraph service of the Brazilian coast serves both the Navy and the National Telegraph. All radio stations are connected with the National Telegraph system for the purposes of radiotelegraphic traffic giving through services with the interior.

There are no direction finding stations, but time signals and meteorological bulletins are sent out from the Marinha radio station.

There are no private, experimental or amateur wireless installations; all have been abolished by order of the Government. There are no wireless societies, clubs or publications. The only company manufacturing *wireless apparatus* in Brazil is Marconi's Wireless Telegraph Company, Limited, Rio de Janeiro, which company also conducts a wireless school. The Telegraph Department have established an official School of Radiotelegraphy. This school will not be open for some time. Dr. Francisco Bhering, Sub-Director of the Telegraph Department and a professor of the Polytechnic Engineering School, has been appointed first Director. One of the salons has been given the name of Marconi, in honour of the great inventor. Another salon bears the name of Morse.


1 Public correspondence with ships
2 Naval Official Traffic
Government
3 Restricted Public correspondence
Inland Public correspondence
Inland Stations
6 Instructional Stations
English Miles
0 300 600
VENEZUELA
COLOMBIA
GUIANA (BRIT.) (DUT.) (FR.)
R. Negro
Equator
R. Amazon
Manáos 3
Santarem Pará
Pará (Belém)
São Luiz 2
Ceará
Fernando de Noronha 1,2
1,2 Natal Norte
1,2 Olinda
PERNAMBUCO
Cruzeiro do Sul 3
Taravaca 3
Senna Madureira 3
Labrea 3
Porto Velho 3
Xapury 3
Rio Branco 3
BRAZIL
R. Xingu
R. Araguaya
R. S. Francisco
R. Madeira
PERU
Bahia
Amaralina 1,2
Cuyaba
Goyaz
BOLIVIA
Caravellas
Abrolhos 2
Ladario 3
R. Paraguay
R. Parana
2 Villa Militar
Nictheroy 2
Cabo de São Thomé 1,2
Quartel General 2
SAO PAULO
RIO DE JANEIRO
Escola Naval 2
Mont Serrat 1,2
PARAGUAY
2 Anhatomirim
PACIFIC OCEAN
ATLANTIC OCEAN
CHILE
ARGENTINA
Porto Alegre
Juncção 1,2
Rio Grande
URUGUAY
0 25 50 Miles
Ilha do Boqueirão 2
Armação 2
Ilha do Governador 2
Ilha Mocangue 2
Forteleza de S. Joas 2
1,2 Babylonia
2 Ilha das Cobras
Forteleza de Santa Cruz 2
RIO
Escola Radio 6
Forteleza de Lage 2
2 Ilha Raza
Villegaignon 2
Forteleza de Imbuhy 2
60 Longitude W. of Greenwich 45

According to the latest information available (December 31st, 1919) the following constitute the number of stations at present working :—

LAND STATIONS.

Coast Stations	27
Stations for Internal Communication only ..	11

(There are no privately owned Land Stations.)

SHIP STATIONS.

Naval vessels	30
Merchant vessels	119

ADMINISTRATION.

A Commission composed of members of the Civil, Naval, Military and Educational authorities are studying the Decree, No. 3,296 of July 10th, 1917, with a view to modifying it. No information is, however, at present available regarding either their findings or its relation to the existing Decree.

The following laws and regulations govern the administration of wireless in the Republic :—

A—Extract from Act relating to the Brazilian Merchant Service.
B—Extract from Law No. 2,719 of December 31st, 1912.
C—Law 2,738 of January 4th, 1913.
D—Decree No. 3,296 of July 10th, 1917.

A — ACT RELATING TO THE MERCHANT SERVICE.

The following Articles refer to Wireless Telegraphy :—

ART. 159.—Those boats must without exception be provided with radiotelegraphic apparatus, approved by the General Direction of Telegraphs, with the necessary power to allow of communication with the wireless stations in the zones in which they trade, when :

(a) they carry passengers and are employed in the coastal trade, of any description whatsoever, and have a registered tonnage of over 300 tons, and for those boats employed in river trade having a registered tonnage of over 500 tons.

(b) They are only employed in the coastal trade as cargo boats, but carry over 30 (thirty) souls all told.

ART. 160.—After the promulgation of this regulation, no ship shall be registered by any Port Authority if it has not complied with the regulations of the preceding Article, the license to navigate being refused to any ship which, within one year from the date of the promulgation of this regulation, shall not have fulfilled the depositions set forth herein.

B — LAW NO. 2,719. DECEMBER 31ST, 1912.

The above Law fixes the Coast Tax at 6 francs for a telegram up to 10 words, and 60 centimes for each extra word. Included in the rate is the transmission between a coast station and the telegraph stations to which the wireless station is directly joined up.

There is a land telegraph charge (*via* National lines) of 25 centimes a word without minimum on telegrams destined to telegraph stations which are not directly connected up with a coast station.

For telegrams exchanged between Brazilian coast stations and ships flying the Brazilian flag the ship tax has been fixed at 240 reis a word with a minimum of 10 words, the coast tax at 400 reis a word with a minimum of 10 words, and the land telegraph charge (if any) at 200 reis a word without a minimum.

C — LAW NO. 2,738. JANUARY 4th, 1913.

A new wireless district was created by the above Law, with a credit of 732 contos, to include the Acre, Amazonas, and Para wireless stations, and these stations have since been taken over by the Telegraph Department and opened to public traffic.

D — WIRELESS LAW NO. 3,296. JULY 10TH, 1917.

The National Congress resolves :—

ART. 1.—The service of radiotelegraphs (telegraphs without wires) in the territories and territorial waters of Brazil is exclusively within the sphere of federal Government.

Sole Paragraph.—The service of radiotelegraphy comprises also radiotelephony (telephones without wires).

ART. 2.—The establishment and exploitation of radiotelegraph stations are within the sphere of the Ministry of Public Works, in respect to its application of a civil character and the Ministries of War and Marine in reference to its applications destined to national defence and to the service of the Army and Navy.

Sole Paragraph.—The three above-mentioned Ministries will enter into an agreement in respect to the localities in which must be established the stations necessary for commerce, for navigation and for the defence of the national territory.

ART. 3.—The Government may give permission to third parties, nationals, without monopoly whatsoever, to instal or work one or more high-power stations in suitable places on the littoral; under the terms of the International Regulations concerning wireless telegraphy and also the Brazilian regulations which are in force for the execution of the same service; for the exclusive purpose of establishing inter-oceanic and inter-territorial communications with corresponding stations in other countries.

October, 1913. The conditions of working are, as in most tropical countries, not altogether good, owing to the strong electrical disturbances and the mountainous country which is covered with dense jungle. The four stations have, however, maintained an uninterrupted day service since their erection.

ADMINISTRATION.

Wireless telegraphy is administered in accordance with the provisions of the following ordinance :—

A—Wireless Telegraphy Proclamation, 1914.

WIRELESS TELEGRAPHY PROCLAMATION, 1914.

As British North Borneo has been included as a party in the International Radiotelegraphic Convention.

The following proclamation controls the use of wireless telegraphy :—

1. This proclamation may be cited as "The Wireless Telegraphy Proclamation, 1914," and shall come into force upon the publication thereof in the *Gazette*.

2. (i) In this proclamation the expression "wireless telegraphy" means any system of communication by telegraph as defined by "The Telegraph Proclamation, 1901," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received;

The expression "locally owned ship" means a ship owned wholly by the Government or by bodies corporate established under and subject to the laws of this State, and having their principal place of business within this State.

(ii) Nothing in this proclamation shall prevent any person from making or using apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may, whenever he shall deem it expedient to do so, license the establishment of any wireless telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in this State or on board any locally owned ship.

4. (i) No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place in this State or on board any locally owned ship except under and in accordance with a license granted in that behalf by the Governor.

(ii) Every such license shall be in such form and for such periods as the Governor may determine, and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

5. (i) Any person establishing a wireless telegraphy station without a license in that behalf, or installing or working any apparatus for wireless telegraphy without a license in that behalf, shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, provided that no proceedings shall be taken against any person under the proclamation except with the previous sanction of the Governor.

(ii) On being satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf, a magistrate may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (i) The Governor may make and, when made, vary or cancel rules more particularly for all or any of the following matters :—

(*a*) For prescribing the form and manner in which applications for licenses under the proclamation are to be made;

(*b*) For prescribing the fees payable on the grant of any license;

(*c*) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship or a British or a foreign ship, in the waters of this State shall be worked so as to prevent the interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in this State or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(*d*) For prohibiting, except with the special or general permission of the Superintendent of Telegraphs, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship or a British or a foreign ship, whilst such ship is in any of the harbours of this State;

(*e*) For prohibiting or regulating, in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether locally owned ships or British or foreign ships, in the waters of this State, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time, either in all cases or in such cases as may be deemed desirable;

(*f*) And generally for the more effectual carrying out of the provisions of this proclamation.

(ii) No rules made in respect of the matters described in paragraphs (*c*), (*d*), and (*e*) of sub-section (i) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. On an application for a license proving to the satisfaction of the Governor that the whole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted to such applicant, subject to such

special terms, conditions, and restrictions as the Governor may think proper that such license shall not be subject to any rent or royalty.

8. (i) Every omission or neglect to comply with, and every act done or attempted to be done contrary to, the provisions of the proclamation, or of any rule made thereunder, or in breach of the conditions and restrictions subject to or upon which any license has been issued, shall be deemed to be an offence against, not otherwise specially provided for, the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(ii) All convictions, forfeitures, and fines under this proclamation, or any rules made thereunder, may be had and recovered before the Court of a Magistrate of the First Class.

BRAZIL

THE great Republic of Brazil extends on both sides of the Equator. With regard to latitude it stretches between 4° 22′ N. and 33° 45′ S., whilst with regard to longitude it lies within the limit of 34° 40′ and 73° 15′ W. It covers an area estimated at 3,298,870 square miles, and abounds in natural wealth of every description. Originally a colony of " Britain's oldest ally," the most cordial relationship between Brazilians and British is traditional with both nations.

CONTROL.

The radiotelegraphic stations of the country are exclusively under the control of the Government, and their administration is regulated by the Minister of Public Works with respect to installations of a civil character, and by the Ministers of State for War and the Navy with respect to installations destined for national defence and the services of the military and naval forces.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
Dr. Pires do Rio	Minister of Public Works	Ministerio da Viacao.
Dr. Antonio Nogueira Penido	Director-General of Telegraphs	Reparticao Geral dos Telegraphes.
Dr. Francisco Bhering ..	Sub-Director Technical Department ..	Do.
Dr. Ferreira Chaves ..	Minister of Marine	Ministerio da Marinha
Admiral Max de Frontin ..	Chief Naval Staff	Do.
Capt. Tenente Mario do Barros Barreto	Chief Naval Radio Service	Do.
Dr. Pandia Calogeras ..	Minister of War	Ministerio da Guerra.
Lt. Aranha de Vasconcellos	Chief of Army Radio Service	—

By Decree No. 13124 of August 7th, 1918, stations under the Ministry of Public Works were transferred to the Ministry of Marine for War purposes, but it has been arranged for these stations to revert to the Ministry of Public Works.

ORGANISATION.

The radiotelegraph service of the Brazilian coast serves both the Navy and the National Telegraph. All radio stations are connected with the National Telegraph system for the purposes of radiotelegraphic traffic giving through services with the interior.

There are no direction finding stations, but time signals and meteorological bulletins are sent out from the Marinha radio station.

There are no private, experimental or amateur wireless installations; all have been abolished by order of the Government. There are no wireless societies, clubs or publications. The only company manufacturing *wireless apparatus* in Brazil is Marconi's Wireless Telegraph Company, Limited, Rio de Janeiro, which company also conducts a wireless school. The Telegraph Department have established an official School of Radiotelegraphy. This school will not be open for some time. Dr. Francisco Bhering, Sub-Director of the Telegraph Department and a professor of the Polytechnic Engineering School, has been appointed first Director. One of the salons has been given the name of Marconi, in honour of the great inventor. Another salon bears the name of Morse.

Par. 1.—These stations must be linked with the National Telegraphs, by whose intermediary shall be collected and distributed the international radiotelegraphic service to and from Brazil in such a manner that the Government shall receive the terminal rate in force.

Par. 2.—The rights that are conferred and the disposals contained in this article may only be used by the Government after the conclusions adopted in respect to this subject by the International Pan-American Convention, which at the recent conference in Buenos Aires was arranged should be held at Washington in 1917.

ART. 4.—The States within the area of their territories which are not yet served by telegraphs with or without wires, and may wish to establish radiotelegraphic stations, shall interest the Department of Telegraphs to instal and work them, debiting the respective costs against such States, and for the purposes of the adjustment of the accounts shall be considered as mutual traffic administrations with the Department.

ART. 5.—The National shipping companies whose steamers have accommodation for more than 50 passengers and whose voyages are longer than 150 miles from the port of origin of its ships and the site of the registered office of the company must instal on board of such steamers a radiotelegraphic station with a minimum range of 100 nautical miles, which shall be worked by an operator who holds a certificate of fitness granted by competent authority. The installations on board shall be provided with emergency apparatus and battery which will permit a continuation of the service in case of the failure of supply of electrical energy by the generators that depend on the main installation.

ART. 6.—Foreign ships will be permitted within or without the territorial waters of Brazil to use the radiotelegraphic stations which they have mounted on board to correspond with the coastal stations erected by the Department of Ways and Public Works previously being authorised by the same Ministry or the Department to this end and subject to the prescriptions and regulations governing this service.

Paragraph.—Foreign warships will be licensed by the authority designated by the Minister for Marine.

ART. 7.—The establishment and working of the coastal radiotelegraphic stations and others of a civil character in the interior of the country will be entrusted to the Department of Telegraphs, to which will fall the duty also of the superintendence and carrying out of all the service of fiscalisation in relation to the employment of this kind of telegraph system by the State by national shipping companies whether by fixed or moving stations and the execution of administrative acts, the promulgation of the dates of openings, the range and the class of each station and the inauguration of proceedings relative to misdemeanours committed against this branch of the service.

Sole Paragraph.—The said Department shall create a special section to which shall be entrusted the management of the service, and also it shall form a school of radiotelegraphy and it shall have authority to contract within or without the country with a professional teacher to take charge of the said school. The only persons qualified or admissable for the personnel of the said radiotelegraphic stations shall be nationals, holders of a certificate of competency issued by the above school, or by other holders of diplomas, admitted to work in the country.

ART. 8.—All the radiotelegraphic stations that were established in Brazilian territory and on board of national ships and on board of foreign ships whilst they remain or navigate on the rivers or territorial waters of Brazil, and claim to establish communication with the national stations for this purpose authorised, must be subject to the rules and regulations of the interior and international services that may be in force.

ART. 9.—Radiotelegraphic correspondence is authorised between national mercantile ships and also between them and foreign ships that possess radiotelegraphic stations aboard as well as between the said ships and the Brazilian coast stations dependent upon the Ministry of Public Works.

ART. 10.—Whatever concession to persons for the establishment of a radiotelegraphic service or whatever authorisation given to use the respective apparatus installed on board foreign ships may be revoked if they do not comply with the rules and regulations or if the Ministries of Marine and War judge it necessary for the security of the country or its defence.

ART. 11.—When the civil or military Federal authorities dependants of the Ministries referred to in Art. 2 have to make scientific or technical experiments in radiotelegraphy they must give notice to the Ministries to which they depend, and when they make experiments on behalf of functionaries of other Ministries, then they must give notice to the Ministry of Ways and Works.

ART. 12.—No other besides the Federal authorities may make experiments or establish experimental radiotelegraphic stations without previous permission of the Ministry of Ways and Public Works, who can give the same with the restrictions and cautions necessary for the security and interests of the State and the efficiency of the traffic of the official stations.

ART. 13.—All the rules and regulations of the Department-General of Telegraphs shall apply to the service of radiotelegraphy with reference to the secrecy to telegrams and as to damages caused to the stations or their material.

ART. 14.—The Government will proceed in the terms of the legislation in force against those who, without permission, exploit, whether publicly or clandestinely, a radiotelegraphic service, and in time of the disturbance of public order or external war these offences shall be classified and punished in the first case as an act of resistance to constituted authority and in the last case as an act of spying.

ART. 15.—Those coastal and interior radiotelegraphic stations which are dependencies of the Ministry of Ways and Public Works, and not reserved for special purposes, will be open for public correspondence.

Sole Paragraph.—No responsibility will be accepted by the radiotelegraphic service for errors of the service or faulty delivery of telegrams, in the terms of Art. 41 of the regulations revised in London.

ART. 16.—Any Brazilian radiotelegraphic station, whether civil or military, terrestrial or marine, will be obliged to give preferential attention to calls for succour that are received by them.

ART. 17.—In all radiotelegraphic stations the public service shall have preference to

private service, save in cases of *force majeure* (accidents and calls for succour).

Art. 18.—Whatever be the object for which radiotelegraphy be established the respective services shall be organised in a form not to cause disturbance to other radiotelegraphic stations, and the respective Ministries shall in all cases adopt provisions and rules necessary to such end.

Art. 19.—Radiotelegrams proceeding from a ship which flies a flag of a non-adherent country to the regulations upon radiotelegraphs of the Convention of London as well as those addressed to ships of such countries shall be transmitted by Brazilian stations only in cases where the respective country has previously declared that it will conform to those rules and regulations in the adjustment of accounts.

Art. 20.—When the Ministries of Marine or War have to establish radiotelegraphic stations for special ends in strategic points and fortified places on land or sea, they will proceed in agreement with each other and with the Ministry of Ways and Public Works when choosing of the site and deciding upon the manner of carrying out the work, to the end that they shall not interfere with their mutual traffics.

These stations may be worked by telegraphists of the civil administration.

Whilst civil functionaries man the stations established in strategical or fortified places they shall be subject to military regime.

Art. 21.—All coastal radiotelegraph stations worked by the Department of General Telegraphs must receive and transmit meteorological observations, and there must be provided installations at one or more stations of the apparatus necessary to transmit time signals in the manner established by the Time Conference held in Paris in October, 1912.

Sole Paragraph.—The national ships provided with apparatus for wireless telegraphy and the foreign ships in the same condition can signal to the coast stations when they are within reach of them their observations about the weather, which will be communicated to the Meteorological Observatory of Rio de Janeiro, and to the ships, on the other hand, will be communicated the observations from that Observatory.

Art. 22.—To the radiotelegraphic service of Brazil are applicable the International Radiotelegraphic Convention held in London and the rules which may be laid down for the execution of the present law.

Art. 23.—The adjustment of accounts shall be made six-monthly between the Department General of Telegraphs and the agencies of the companies of national and foreign ships, and in their absence with the administrations to which those ships are attached in accordance with what is established by Art. XLII of the International Regulations (revised in London).

Art. 24.—The call letters of the stations on board the national war and merchant ships will be distributed by the Department of General Telegraphs in accordance with the series of indicators reserved for Brazil by the Secretary of the International Union of Telegraphs of Berne.

Art. 25.—The radiotelegraphic stations in the interior of the country shall be established and worked by the Department of General Telegraphs, organising proper radiotelegraphic districts in regions where there are none, connecting them with the telegraphic service by means of wired lines and working with a parallel service of wired telegraphs.

Art. 26.—Annulling all whatsoever acts in this connection effected by the Government prior to the promulgation of the present law.

Art. 27.—It shall be the sphere of the Ministry of Ways and Public Works to make provision for the establishment and initiation of an international radiotelegraphic service and with the adjoining countries as well as the drawing up of the basis of a definite agreement and referendum to the National Congress.

Art. 28.—All previous acts to the contrar are revoked.

BRITISH EAST AFRICA

(See Kenya Colony.)

BRITISH GUIANA

THIS Colony, which includes the counties of Demerara, Essequibo and Berbice, lies on the north-east coast of South America, and has a total area of 90,277 square miles. The Government is administered by a Governor with a Court of Policy consisting of fifteen other members, seven official and eight elected.

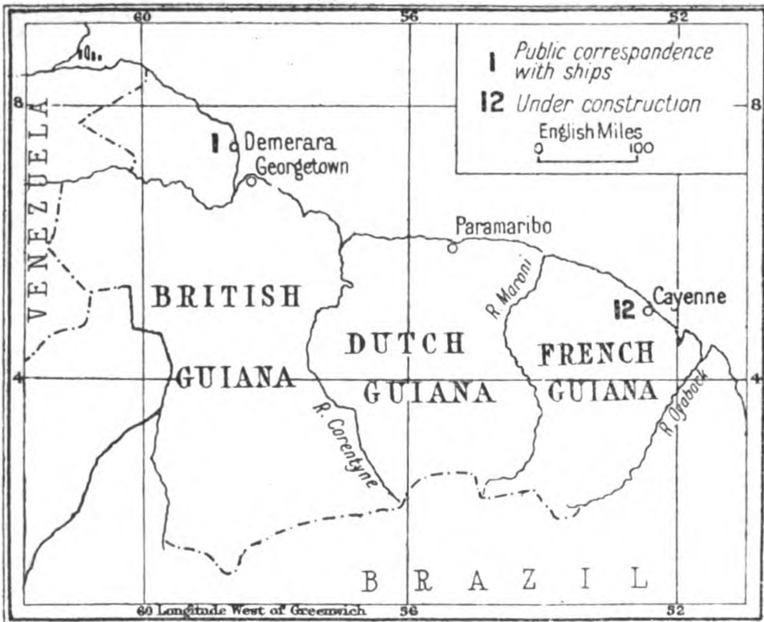
CONTROL AND ORGANISATION.

Both the ownership and working of all radiotelegraphic stations are vested in the Government. Only one station is open for public correspondence with ships.

ADMINISTRATION.

The administration of wireless telegraphy is carried out under the following regulations :—

A—The Telegraphic Ordinance, 1903.
B—Ordinance No. 7 of 1910.



Cayenne open for public general correspondence.

A This Ordinance may be cited as "The Telegraph Ordinance, 1903."

2. In this Ordinance "telegraph" means an electric, galvanic, or magnetic telegraph, and includes appliances and apparatus for transmitting or making telegraphic, telephonic or other communication by means of electricity, galvanism or magnetism, whether the same be transmitted by means of wires or cables or without wires or cables.

3. The Governor-in-Council shall have the exclusive privilege of establishing, maintaining and working telegraphs between the Colony and places outside of the Colony.

Provided that the Governor-in-Council may grant a license on such conditions and in consideration of such payments as he thinks fit, to any person, company or body corporate, to establish, maintain or work a telegraph between the Colony and any place or places outside the Colony; and

Provided that nothing in this Ordinance shall apply to or in any way affect the rights already granted to the West India and Panama Telegraph Company, Limited, under any Ordinance or Ordinances passed before the Commencement of this Ordinance.

Ordinance No. 7 of 1910.

B 1. (1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any British ship registered in the Colony, except under and in accordance with a license granted in that behalf by the Governor-in-Council.

(2) A person shall not work any apparatus for wireless telegraphy installed on any merchant ship (whether British or foreign) whilst that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations made in that behalf by the Governor-in-Council, and the Governor-in-Council may, by any such regulations, impose penalties recoverable summarily for the breach of any such regulations, not exceeding fifty dollars for each offence, and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ship.

(3) If any person establishes a wireless telegraph station without a license in that behalf, or instals or works any apparatus for wireless telegraphy without a license in that behalf, he shall be guilty of a misdemeanour and be liable on summary conviction thereof to a penalty not exceeding fifty dollars, and, on conviction on indictment, to a fine not exceeding five hundred dollars, or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license.

(4) If a Justice of the Peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship within his jurisdiction without a license in that behalf or contrary to the provisions of the regulations made under sub-section two of

this section, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Governor or the Postmaster-General and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

(5) The expression "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: Provided, That nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1910.

BRITISH HONDURAS

THE Crown Colony of British Honduras lies in Central America within 18° 29′ 5″ to 15° 53′ 55″ N. latitude and 89° 9′ 22″ to 88° 10′ W. longitude. Its extreme length and breadth are 174 miles and 68 miles respectively; it abuts on the Atlantic, and is bounded on the north by Yucatan (Mexico), on the west and south by Guatemala, and on the east by the Caribbean Sea. The total area is about 8,598 square miles.

CONTROL.

The ownership and working of the one radiotelegraphic station are vested in the Government. An experimental license has been granted to S. John's Roman Catholic College in Form 2 issued by H.B.M. Postmaster-General in 1905.

The Belize wireless wireless station is open for continuous ship service, receiving calls and answering on the 600 metre wavelength. Commercial traffic is handled for the United States through the United Fruit Company's station at Swan Island (*see Map of West Indies, under Leeward Islands*); through rate 36 cents per word.

Commercial traffic for the United Kingdom and other European countries is handled through the Admiralty station at Christiana, Jamaica; through rate to U.K. 62 cents per word.

The station is equipped for meteorological work, and storm warnings are broadcasted at all times on the 600 and 1,000 metre waves. No aviation or D.F. work is performed.

The station is at present undergoing a complete refit, at the conclusion of which it will conform to the following:—

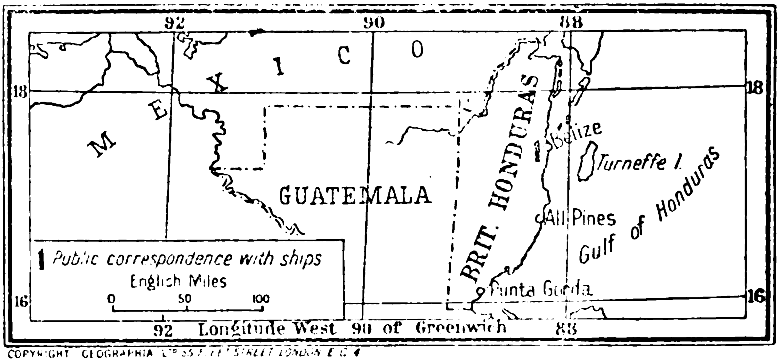
Station.	Call.	Range metres	Controlled by	Wave-length, metres.	Nature of Service.	Hours of Service.	Coast Charges	
							Per Word.	Minimum Charge.
							Francs.	Francs.
British Honduras	VPP	400[2]	Government	600 / 1,000	P.G.	N[3]	0·50[4]	5·00[4]
Belize	—	1,500[1]	—	4,200[1]	—	—	—	—

[1] 25 kw. arc.
[2] 5 kw. quenched spark.
[3] Except at following hours when station is working Swan Island: 0540, 0835, 1040, 1500, 1800. Local time (90th meridian).
[4] This includes the charge for transmission over the telegraph lines of the Colony.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. Gerald S. W. Smith	Colonial Postmaster	Belize.
Mr. James Owen Hall	Superintendent of Wireless Telegraphs	Do.

During the war no privately owned apparatus was allowed in the colony, but laws are being prepared for the regulation thereof in accordance with the London Convention of 1912.



ADMINISTRATION.

Wireless telegraphy in British Honduras is regulated by Chapter CXCIX of the Consolidated Laws of British Honduras (revised edition), the text of which will be found below.

A—Consolidated Law.
B—Schedule.
C—License to use Wireless Telegraphy for Experimental Purposes.

CHAPTER CXCIX OF THE CONSOLIDATED LAWS OF BRITISH HONDURAS (REVISED EDITION).

TO REGULATE WIRELESS TELEGRAPHY.

A 1. *Interpretation.*—In this chapter "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. *License to Instal, &c., Wireless Telegraphic Apparatus.*—(1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine and shall contain the terms, conditions and restrictions on and subject to which it is granted.

3. *Apparatus not to be worked on merchant ship except in accordance with regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this chapter.

4. *Regulations.*—(1) The Governor may from time to time make regulations for carrying into effect the purpose of this chapter, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this chapter.

(2) The regulations in the schedule to this chapter shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. *Search Warrants.*—If a District Commissioner is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship contrary to the provisions of this chapter or of any regulations made under this chapter, or of any license granted under this chapter, he may grant a search warrant to any police officer or any person appointed in that behalf by the Superintendent of Police and named in the warrant and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. *Penalty for contravention of chapter.*—(1) Any person who shall offend against any provision of this chapter or any regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding two hundred and fifty dollars, and upon such conviction the Court may order that

any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) *Procedure.*—Proceedings shall be taken before the District Commissioner for the Belize District on the complaint of the Superintendent of Police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

SCHEDULE—Section 4 (2).

REGULATIONS.

B i. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(*a*) Naval signalling, or

(*b*) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

ii. In these regulations "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

iii. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

iv. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

v. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

vi. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

EXPERIMENTAL FORM 2.

Dated

LICENSE TO USE WIRELESS TELEGRAPHY FOR EXPERIMENTAL PURPOSES.

C This Indenture made the day of One thousand nine hundred and between the Colonial Secretary of the Colony of British Honduras on behalf of the Government of British Honduras of the one part and (hereinafter called "the licensee") of the other part.

Whereas the licensee is desirous of establishing installing and working an amateur wireless telegraph apparatus for demonstration purposes with the sole object of giving instruction in the Science Classes of Saint John's College;

And whereas by reason of the provisions of Chapter 199 of the Consolidated Laws (Revised Edition) it is unlawful to establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place except under and in accordance with a license granted in that behalf by the Governor and it is also unlawful save as in the said Law provided to transmit wireless telegrams within the Colony;

And whereas at the request of the licensee the Governor has agreed to grant to the licensee the license powers and authorities hereinafter expressed and contained for the period upon the terms and subject to the stipulations and conditions hereinafter appearing;

Now this Indenture witnesseth that in consideration of the premises and of the matters hereinafter appearing it is hereby agreed and declared between and by the parties hereto and the licensee (as to the covenants and agreements hereinafter contained on his part) doth hereby covenant and agree with the Colonial Secretary and the Colonial Secretary (as to the covenants and agreements hereinafter contained on his part) in exercise of all powers and authorities enabling him in this behalf doth hereby covenant and agree with the licensee in manner following (that is to say):—

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in Chapter 199 of the Consolidated Laws (Revised Edition).

The expression "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or Naval Station and any other wireless telegraph station whether on shore or on any ship.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

2. Subject to the provisions of this Indenture the licensee shall during the term or period commencing on the
and terminating on the
have license and permission from the Colonial Secretary—

to establish instal and work at the station specified in the Schedule hereto apparatus for wireless telegraphy (hereinafter called "the licensed apparatus") provided that the apparatus installed at such station shall be of the character specified in the said Schedule.

3. The licensed apparatus shall not be used by the licensee or by any person either on his behalf or by his permission for any purpose except for the purpose of conducting experiments in wireless telegraphy.

4. (1) The licensed apparatus shall be so worked as not to interfere with the working of any wireless telegraph station established in the Colony or the territorial waters abutting on the coasts thereof and in particular with the transmission or receipt of any messages between or at any wireless telegraph station established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the licensee and any person acting on his behalf or by his permission shall comply with all directions which shall be given to the licensee by the Colonial Secretary with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not without the consent in writing of the Colonial Secretary be altered in respect of any of the particulars mentioned in the Schedule nereto.

5.* (1) The licensee shall not (either by himself or by any person acting on his behalf or by his permission) by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(2) Whenever the operators at the station of the licensee perceive through the medium of the instruments used by them that naval signalling is proceeding they shall refrain from using the licensed apparatus until all indication that naval signalling is proceeding shall have ceased.

(3) The licensee and any person acting on his behalf or by his permission shall if so required in writing by the Colonial Secretary cease to use the licensed apparatus.

(4) If the Colonial Secretary is of opinion that the working of the licensed apparatus at the station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall when required in writing by the Colonial Secretary close the said station.

(5) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this indenture.

6. Neither the licensee nor any person acting on his behalf or by his permission shall divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid and transmitted by naval signalling or by any system of wireless telegraphy provided or maintained by the Government of the Colony.

7. The Colonial Secretary and his engineers and agents may from time to time and at all reasonable times enter upon the station or other premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such places respectively and the licensee shall afford all requisite and proper facilities for such inspection and shall secure to the Colonial Secretary the right for the purpose aforesaid of entry from time to time into and on such station and premises as may be in the possession or occupation of any person or persons other than the licensee.

8. All apparatus used or intended to be used under this license shall be so erected fixed placed and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance working or user of any telegraphic line of the Colony.

*This clause will be omitted in the case of inland installations.

9. If and whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by Wireless Telegraphy it shall be lawful for the Governor by warrant under his hand to direct and cause the licensed apparatus to be taken possession of in the name and on behalf of His Majesty.

10. The Colonial Secretary may at any time with the Governor's approval give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Colonial Secretary under any covenant or provision herein contained on the part of the licensee to be observed and performed.

11. In case of any breach non-observance or non-performance by or on the part of the licensee of any of the covenants or conditions herein contained and on the part of the licensee to be observed and performed the Colonial Secretary may by writing revoke and determine these presents and the license powers and authorities hereinbefore granted and each and every of them and thereupon these presents and the said license powers and authorities and each and every of them shall absolutely cease determine and become void.

Provided always that no such revocation or determination as aforesaid shall prejudice or affect any right of action or remedy which shall have accrued or shall thereafter accrue to either of the parties hereto under the covenants herein contained.

12. Any notice request or consent (whether expressed to be in writing or not) to be given by the Colonial Secretary under these presents may be served by sending the same by registered post letter to the licensee and any notice to be given by the licensee under these presents may be served by sending the same by registered post letter addressed to the Colonial Secretary.

Signed on behalf of the Government of British Honduras

Colonial Secretary.

Witness.

Signed by the licensee on behalf of

Belize, British Honduras.

Licensee.

Witness.

THE SCHEDULE BEFORE REFERRED TO:—

Name of Station.	Character of Apparatus.		
	Maximum Range of Signalling with the Licensee's Own Apparatus.	Power (Current and Voltage).	Source of Power.
(1)	(2) ——— miles	(3) Current and Voltage ..	(4) Batteries

BRITISH INDIA

GREAT BRITAIN'S connection with India followed on that of the Portuguese, Dutch, and French in the fifteenth, sixteenth, and seventeenth centuries respectively. The London East India Company, formed to concentrate in a single corporation the isolated British trading efforts in the Far East, was incorporated under Royal Charter by Queen Elizabeth on December 31st, 1600.

The famous Indian mutiny of 1857 brought a realisation of the fact that a commercial company is not suited for administering an Empire, and in 1858 Queen Victoria assumed " the Government of the territories in India." In 1877 the British Queen adopted the title of " Empress of India," and at present the name " British India " covers all territories governed by the King-Emperor through the Viceroy of India, or through any officer subordinate to him; whilst " India " means " British India," together with any territories of any native prince or chief under the suzerainty of His Majesty, exercised through the Governor-General of India or any officer subordinate to him (Act 52 & 53 Vict., C. 63, S. 18).

Continental India (including Baluchistan) stretches between 8° 0′ and 37° 0′ N. latitude, and lies in 61° 0′ to 101° 0′ E. longitude. Delhi, the new capital, is in 77° 0′ E. longitude. The total area covers 1,803,000 square miles, with a population of over 315,000,000; in other words, it includes a territory larger than the continent of Europe, exclusive of Russia.

CONTROL.

The control of radiotelegraphy in India is vested in the Director-General of Posts and Telegraphs. With the exception of portable stations employed for purely military purposes and others belonging to the Royal Air Force, all wireless stations in India and Burma are worked and controlled by the Indian Department of Posts and Telegraphs. The Indian Wireless Telegraph Board was constituted in 1920 for the purpose of co-ordinating military and civil wireless telegraphic and telephonic requirements.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. G. R. Clarke, C.S.I., O B E., M L A., I.C.S.	Director-General of Posts and Telegraphs ..	Simla
Commander R. L. Nicholson, D.S.O., late R.N.	Director of Wireless Telegraphs	Simla
Captain P. J. Edmunds ..	Officer-in-Charge, Karachi Wireless Division	Karachi
Mr. N. H. Swinstead	Controller of Wireless Traffic	Simla
Captain P. Ryan	Officer-in-Charge Simla Wireless Division ..	Simla
Captain R. N. Hawes	Superintendent of Wireless Instruction ..	Karachi

ORGANISATION.

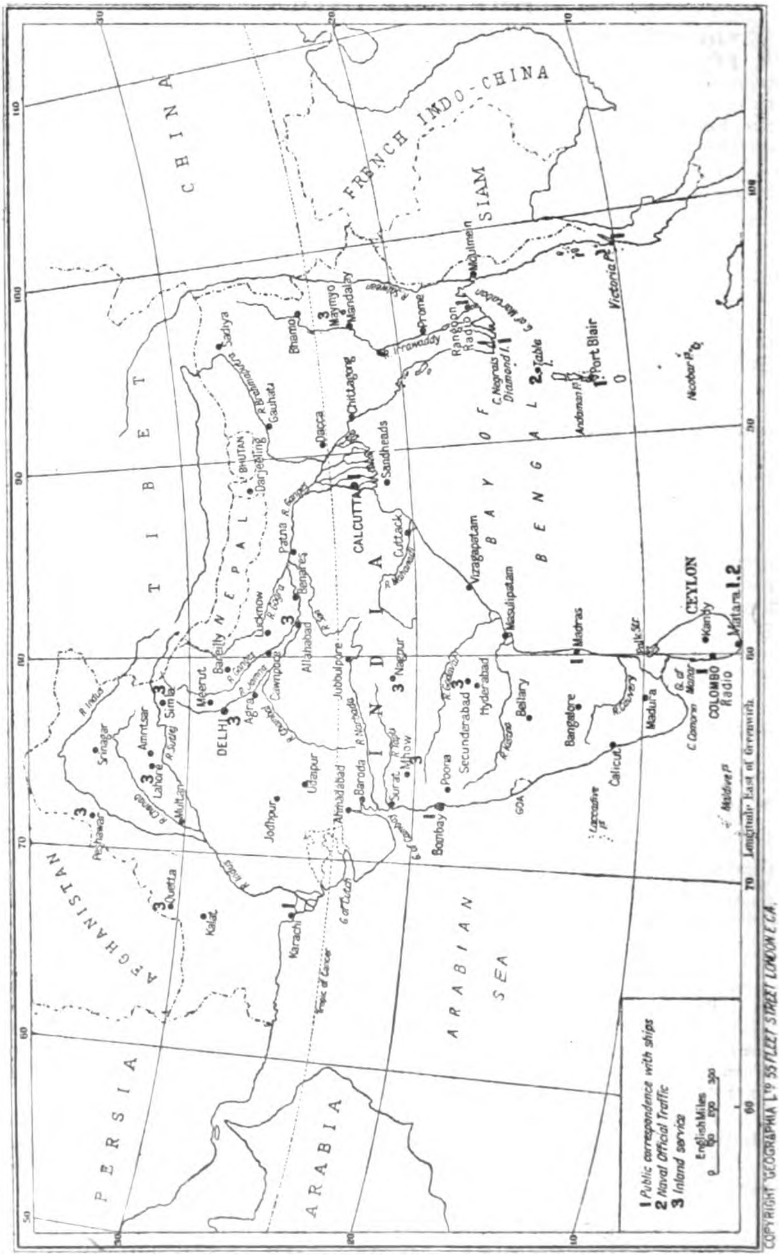
The first stations opened for traffic in India were three 2 kw. Lodge-Muirhead stations at Diamond Island, Table Island, and Port Blair, erected for the maintenance of communication with the Andaman Islands. These date from March, 1905. All existing Wireless Telegraph stations in India form part of the Indian Telegraph network of the country.

The establishment of a High-speed Commercial Wireless Circuit between Madras and Rangoon is in hand.

There are no *privately owned* stations, nor are there any Wireless Clubs or Societies.

ADMINISTRATION.

The administration of radiotelegraphy in India is at present governed by the Indian Telegraph Act, XIII, of 1885, as modified up to June 1st 1910.


PERSIA
ARABIA
AFGHANISTAN
CHINA
TIBET
NEPAL
BHUTAN
FRENCH INDO-CHINA
SIAM
INDIA
ARABIAN SEA
BAY OF BENGAL
CEYLON
Karachi
Quetta
Kalat
Peshawar
Multan
Lahore
Amritsar
Srinagar
Simla
DELHI
Meerut
Bareilly
Agra
Lucknow
Cawnpore
Allahabad
Benares
Patna
Darjeeling
Gauhati
Sadiya
Dacca
Chittagong
CALCUTTA
Sandheads
Cuttack
Jubbulpore
Nagpur
Jodhpur
Udaipur
Ahmadabad
Baroda
Surat
Mhow
Bombay
Poona
Secunderabad
Hyderabad
Vizagapatam
Masulipatam
Bellary
Bangalore
Madras
Calicut
Madura
GOA
COLOMBO Radio
Kandy
Matara
Bhamo
Maymyo
Mandalay
Prome
Rangoon Radio
Moulmein
Victoria Pt
C. Negrais
Diamond I.
Table I.
Port Blair
Andaman Is.
Nicobar Is.
Laccadive Is.
Maldive Is.
C. Comorin
Tropic of Cancer
Longitude East of Greenwich
1 Public correspondence with ships
2 Naval Official Traffic
3 Inland service
English Miles
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This is further extended by (1) the Indian Telegraph (Amendment) Act, VII, of 1914, by (2) the Indian Post Office and Telegraph (Amendment) Act, XIV, of 1914, and by (3) the Indian Wireless Telegraph (Ships) Rules, 1915.

At present no licenses to work wireless telegraphy are issued, and no experiments by private individuals are permitted.

The following Laws and Regulations affecting radiotelegraphy in India are printed in our pages, but the present Act and Rules and the whole question of licenses are under revision by the Government of India.

It is *proposed*:—

(*a*) To license the import, manufacture and sale, etc., of wireless apparatus in British India.
(*b*) To grant licenses for experimental and instructional purposes.
(*c*) To grant licenses for business purposes.

The licenses may be either for transmitting and receiving or receiving only—depending upon the requirements of the licensee.

This necessitates considerable amendment to the present Act, but it is probable that the revision will be published by the end of 1921.

A—Abstract of the Indian Telegraph Act, No. XIII, of 1885, as modified up to June 1st, 1910.

B—The Indian Telegraph (Amendment) Act. No. VII, of 1914.

C—The Indian Post Office and Telegraph (Amendment) Act, No. XIV, of 1914.

D—The Indian Wireless Telegraph (Ships) Rules, 1915.

E—First Schedule.

F—Second Schedule.

TELEGRAPH ACT XII. OF 1885.
(Modified up to June 1st, 1910.)

A Part I. deals with former Acts which are hereby repealed, and with definitions of terms used in the present Act.

Part II. reads as follows:—

PART II.

PRIVILEGES AND POWERS OF THE GOVERNMENT.

4. Within British India, the Governor-General in Council shall have the exclusive privilege of establishing, maintaining and working telegraphs:

Provided that the Governor-General in Council may grant a license, on such conditions* and in consideration of such payments as he thinks fit, to any person to establish, maintain or work a telegraph within any part of British India.

5. (1) On the occurrence of any public emergency, or in the interest of the public safety, the Governor-General in Council or a Local Government, or any officer specially authorised in this behalf by the Governor-General in Council, may—

(*a*) take temporary possession of any telegraph established, maintained or worked by any person licensed under this Act; or

(*b*) order that any message or class of messages to or from any person or class of persons or relating to any particular subject, brought for transmission by, or transmitted or received by, any telegraph, shall not be transmitted, or shall be intercepted or detained, or shall be disclosed to the Government or an officer thereof mentioned in the order.

(2) If any doubt arises as to the existence of a public emergency, or whether any act done under sub-section (1) was in the interest of the public safety, a certificate signed by a Secretary to the Government of India or to the Local Government shall be conclusive proof on the point.

6. Any railway company, on being required so to do by the Governor-General in Council, shall permit the Government to establish and maintain a telegraph upon any part of the land of the company, and shall give every reasonable facility for working the same.

7. (1) The Governor-General in Council may, from time to time, by notification in the *Gazette* of India, make rules consistent with this Act for the conduct of all or any telegraphs established, maintained or worked by the Government or by persons licensed under this Act.

(2) Rules under this section may provide for all or any of the following, among other matters, that is to say:—

(*a*) the rates at which, and the other conditions and restrictions subject to which, messages shall be transmitted;

(*b*) the precautions to be taken for preventing the improper interception or disclosure of messages;

(*c*) the period for which, and the conditions subject to which, telegrams and other documents belonging to, or being in the custody of, telegraph officers shall be preserved; and

(*d*) the fees to be charged for searching

* For rules as to grant of telephone exchanges and telegram subscription rules in connection with such exchanges, see Genl. Stat. R. & O., Vol. II., pp. 972 and 983.

for telegrams or other documents in the custody of any telegraph officer.

(3) When making rules for the conduct of any telegraph established, maintained or worked by any person licensed under this Act, the Governor-General in Council may, by the rules, prescribe fines for any breach of the same:

Provided that the fines so prescribed shall not exceed the following limits, namely:—

(i) when the person licensed under this Act is punishable for the breach, one thousand rupees, and in the case of a continuing breach a further fine of two hundred rupees for every day after the first during the whole or any part of which the breach continues;

(ii) when a servant of the person so licensed, or any other person, is punishable for the breach, one-fourth of the amounts specified in clause (i).

8. The Governor-General in Council may, at any time, revoke any license granted under section 4, on the breach of any of the conditions therein contained, or in default of payment of any consideration payable thereunder.

9. The Secretary of State for India in Council shall not be responsible for any loss or damage which may occur in consequence of any telegraph officer failing in his duty with respect to the receipt, transmission or delivery of any message; and no such officer shall be responsible for any such loss or damage unless he causes the same negligently, maliciously or fraudulently.

Part III deals with power to place telegraph lines and posts, and covers sections 10–18, finishing with *Paragraph* 19.

19. Every telegraph line or post placed before the passing of this Act under, over, along, across, in or upon any property, for the purposes of a telegraph established or maintained by the Government, shall be deemed to have been placed in exercise of the powers conferred by, and after observance of all the requirements of, this Act.

Part IV deals with penalties under the Act, and contains Paragraphs 20, 21, 22, 23, and 24; passing on to *Paragraph* 25.

25. If any person, intending—

(*a*) to prevent or obstruct the transmission or delivery of any message, or

(*b*) to intercept or to acquaint himself with the contents of any message, or

(*c*) to commit mischief,

damages, removes, tampers with or touches any battery, machinery, telegraph line, post, or other thing whatever, being part of or used in or about any telegraph or in the working thereof, he shall be punished with imprisonment for a term which may extend to three years, or with fine, or with both.

Paragraphs 26, 27, 28 and 29 deal with offences connected with controversion of official secrecy and misconduct on the part of officials. This Part IV. concludes with *Paragraphs* 30-32.

30. If any person fraudulently retains or wilfully secretes, makes away with or detains a message which ought to have been delivered to some other person, or, being required by a telegraph officer to deliver up any such message, neglects or refuses to do so, he shall be punished with imprisonment for a term which may extend to two years or with fine, or with both.

31. A telegraph officer shall be deemed a public servant within the meaning of sections 161, 162, 163, 164 and 165 of the Indian Penal Code; * and in the definition of "legal remuneration" contained in the said section 161, the word "Government" shall, for the purposes of this Act, be deemed to include a person licensed under this Act.

32. Whoever attempts to commit any offence punishable under this Act shall be punished with the punishment herein provided for the offence.

Part V contains supplemental provisions covering charges for damage made against Local Governments and contains Paragraphs 33 and 34 of the Act.

ACT No. VII. of 1914.

Passed by the Governor-General of India in Council.

(*Received the assent of the Governor-General on the 28th February,* 1914.)

An Act further to amend the Indian Telegraph Act, 1885.

Whereas it is expedient further to amend the Indian Telegraph Act 1885; It is hereby enacted as follows:—

1. This Act may be called the Indian Telegraph (Amendment) Act, 1914.

2. For sub-section (2) of section 1 of the Indian Telegraph Act, 1885 (hereinafter called the said Act), the following shall be substituted, namely:—

"(2) It extends to the whole of British India, including the Sonthal Parganas and the Pargana of Spiti, and it applies also to—

(*a*) all native Indian subjects of His Majesty in any place without and beyond British India;

(*b*) all other British subjects within the territories of any Native State in India; and

(*c*) all servants of the King, whether British subjects or not, within the territories of any Native State of India."

3. In clause (1) of section 3 of the said Act for the words "transmitting or making," the words "making, transmitting or receiving" shall be substituted.

4. Section 4 of the said Act shall be re numbered 4 (1) and after the said sub-section the following proviso and sub-section shall be added, namely:—

"Provided further that the Governor-General in Council may, by rules made under this Act and published in the *Gazette* of India, permit, subject to such restrictions and conditions as he thinks fit, the establishment, maintenance and working—

(*a*) of wireless telegraphs on ships within Indian territorial waters, and

(*b*) of telegraphs other than wireless telegraphs within any part of British India.

"(2) The Governor-General in Council may, by notification in the *Gazette* of India, delegate to the telegraph authority all or any of his powers under the first proviso to sub-section (1).

"The exercise by the telegraph authority of any power so delegated shall be subject to such restrictions and conditions as the Governor-General in Council may, by the notification, think fit to impose."

5. After section 19 of the said Act the following sections shall be inserted, namely:—

"19A. (1) Any person desiring to deal in the legal exercise of a right with any property in such a manner as is likely to cause damage

* Genl. Acts, Vol. I.

to a telegraph line or post which has been duly placed in accordance with the provisions of this Act, or to interrupt or interfere with telegraphic communication, shall give not less than one month's notice in writing of the intended exercise of such right to the telegraph authority, or to any telegraph officer whom the telegraph authority may empower in this behalf.

"(2) If any such person without having complied with the provisions of sub-section (1) deals with any property in such a manner as is likely to cause damage to any telegraph line or post, or to interrupt or interfere with telegraphic communication, a Magistrate of the first or second class may, on the application of the telegraph authority, order such person to abstain from dealing with such property in such manner for a period not exceeding one month from the date of his order and forthwith to take such action with regard to such property as may be in the opinion of the Magistrate necessary to remedy or prevent such damage, interruption or interference during such period.

"(3) A person dealing with any property in the manner referred to in sub-section (1) with the *bona fide* intention of averting imminent danger of personal injury to himself or any other human being shall be deemed to have complied with the provisions of the said sub-section if he gives such notice of the intended exercise of the right as is in the circumstances possible, or where no such previous notice can be given without incurring the imminent danger referred to above, if he forthwith gives notice of the actual exercise of such right to the authority or officer specified in the said sub-section.

"19B. The Governor-General in Council may, by notification in the *Gazette* of India, confer upon any licensee under section 4, in respect of the extent of his license and subject to any conditions and restrictions which the Governor-General in Council may think fit to impose and to the provisions of this Part, all or any of the powers which the telegraph authority possesses under this Part with regard to a telegraph established or maintained by the Government or to be so established or maintained:

"Provided that the notice prescribed in section 19A shall always be given to the telegraph authority or officer empowered to receive notice under section 19A (1)."

6. For section 20 of the said Act the following section shall be substituted, namely:—

"20. (1) If any person establishes, maintains or works a telegraph within British India in contravention of the provisions of section 4 or otherwise than as permitted by rules made under that section, he shall be punished, if the telegraph is a wireless telegraph, with imprisonment which may extend to three years, or with fine, or with both, and, in any other case, with a fine which may extend to one thousand rupees.

"(2) Notwithstanding anything contained in the Code of Criminal Procedure, 1898, offences under this section in respect of a wireless telegraph shall, for the purposes of the said Code, be bailable and noncognisable.

"(3) When any person is convicted of an offence punishable under this section, the Court before which he is convicted may direct that the telegraph in respect of which the offence has been committed, or any part of such telegraph, be forfeited to His Majesty."

7. After section 20 of the said Act the following section shall be inserted—namely:

"20A. If the holder of a license granted under section 4 contravenes any condition contained in his license, he shall be punished with fine which may extend to one thousand rupees, and with a further fine which may extend to five hundred rupees for every week during which the breach of the condition continues."

8. After section 25 of the said Act the following section shall be inserted—namely:

"25A. If, in any case not provided for by section 25, any person deals with any property and thereby wilfully or negligently damages any telegraph line or post duly placed on such property in accordance with the provisions of this Act, he shall be liable to pay the telegraph authority such expenses (if any) as may be incurred in making good such damage, and shall also, if the telegraphic communication is by reason of the damage so caused interrupted, be punishable with a fine which may extend to one thousand rupees:

"Provided that the provisions of this section shall not apply where such damage or interruption is caused by a person dealing with any property in the legal exercise of a right if he has complied with the provisions of section 19A (1)."

9. After section 29 of the said Act the following section shall be inserted—namely:

"29A. If any person, without due authority,

(*a*) makes or issues any document of a nature reasonably calculated to cause it to be believed that the document has been issued by, or under the authority of, the Director-General of Telegraphs, or

(*b*) makes on any document any mark in imitation of, or similar to, or purporting to be, any stamp or mark of any Telegraph Office under the Director-General of Telegraphs, or a mark of a nature reasonably calculated to cause it to be believed that the document so marked has been issued by, or under the authority of, the Director-General of Telegraphs

he shall be punished with fine which may extend to fifty rupees."

10. In section 34 (1) of the said Act after the figures and word "18 sub-section (1)," the words, figures and letter "and section 19A sub-section (2)," shall be inserted.

ACT No. XIV. OF 1914.

PASSED BY THE GOVERNOR-GENERAL OF INDIA IN COUNCIL.

(*Received the assent of the Governor-General on 16th September*, 1914.)

C An Act further to amend the Indian Telegraph Act, 1885, and the Indian Post Office Act, 1898.

Whereas in view of the amalgamation of the offices of Director-General of Telegraphs and of Director-General of the Post Office of India, it is expedient further to amend the Indian Telegraph Act, 1885, and the Indian Post Office Act, 1898:

It is hereby enacted as follows:

1. This Act may be called the Indian Post Office and Telegraph (Amendment) Act, 1914.

2. In clause (6) of section 3 and in section 29A of the Indian Telegraph Act, 1885, for the word "Telegraphs," wherever it occurs the words "Posts and Telegraphs" shall be substituted.

3. In section 2 of the Indian Post Office Act, 1898—

(i.) in clause (*a*) for the words "the Post Office of India" the words "Posts and Telegraphs" shall be substituted; and

(ii.) in clause (*k*), after the word "department," the words "established for the purpose of carrying the provisions of the Act into effect and" shall be inserted.

INDIAN WIRELESS TELEGRAPH (SHIPS) RULES, 1915.

DATED DELHI, FEBRUARY 24TH, 1917.

In exercise of the powers conferred by section 4 of the Indian Telegraph Act, 1885 (XIII of 1885), as amended by the Indian Telegraph (Amendment) Act, 1914, (VII of 1914), the Governor-General in Council is pleased to make the following rules regulating the establishment, maintenance and working of wireless telegraphs on ships within Indian territorial waters:

1. These rules may be called the Indian Wireless Telegraph (Ships) Rules, 1915.

2. In these rules, unless there is anything repugnant in the subject or context—

"Convention" means the International Radiotelegraph Convention concluded at London on July 5th, 1912.

"Director-General" means the Director-General of Posts and Telegraphs, India.

"Harbour" includes harbours whether natural or artificial, estuaries, navigable rivers, piers, jetties, and other works in or at which ships can obtain shelter, or ship and unship goods or passengers.

"License" means a license granted under these rules.

"Service Regulations" means the service regulations annexed to the Convention.

3. Except by general or special permission in writing from the Director-General or an officer authorised by him in this behalf, no person shall work or use a wireless telegraph on board any ship (other than a ship of war) whilst the ship is in any harbour in India.

4. No person shall send any message by means of the wireless telegraph on board any ship (other than a ship of war), whilst the ship is within Indian territorial waters, when and where such message can be forwarded by a Government telegraph either with or without wires.

5. When communications are made by means of wireless telegraph between any ship within Indian territorial waters and a wireless telegraph station on land, the rules in force for the working of wireless telegraph at that station as given in the Handbook, General Rules, and Departmental Instructions for Radiotelegraph stations, shall be observed.

6. No person shall work the wireless telegraph on board any ship within Indian territorial waters in such a way as to interrupt or interfere with—

(*a*) Naval or military signalling; or

(*b*) the transmission of messages between other wireless telegraph stations.

Explanation.—In this rule Naval or Military signalling includes signalling or communicating by means of any system of wireless telegraphy, by His Majesty's Imperial, Colonial, or Indian Naval or Military Forces.

7. The Director-General or any officer authorised by him in this behalf may demand to be shown the licence or copy of such license issued to any ship authorising the use of any wireless telegraph on board the ship or the certificate issued to the operator on the ship, and every person having the license or certificate in his possession or under his control shall comply with such demand.

8. No wireless telegraph shall be established or worked on any ship registered in British India except under license granted by the Director-General on behalf of the Governor-General in Council in the form in the First Schedule to these rules and subject to the terms and conditions set forth in that form.

9. The Director-General shall not grant a licence unless he is satisfied that—

(*a*) the wireless telegraph can be worked in accordance with the provisions of the Convention and the Service Regulations, and

(*b*) operators qualified in accordance with Rule 12 will be employed to work the same.

10. A license may include any number of ships belonging to the same person.

11. (1) The Director-General may grant to the holder of a license a supplementary license in respect of any ship belonging to him and not included in the original license.

(2) A supplementary license shall be in such form as the Director-General thinks fit, and shall be deemed to be incorporated with the original license, and the original license shall apply to each ship included in the supplementary license to the same extent as if the ship had been included in the original license.

12. No person shall work a wireless telegraph on board any ship registered in British India unless he is of British nationality and holds either a first or a second-class certificate of competency granted by, or under the authority of, the Director-General or a certificate (issued by the authority empowered to grant such certificates) entitling the holder to be employed as a wireless telegraph operator on board ships registered in the United Kingdom or in a British Possession or Protectorate.

13. (1) The Director-General may grant certificates of competency in accordance with the conditions contained in the Second Schedule to these rules.

(2) Should the holder of a certificate of competency granted under these rules be proved to the satisfaction of the Director-General wilfully or negligently to have failed to comply with the provisions of the Convention or the Service Regulations, or any other regulations which may be issued from time to time for his guidance, the Director-General may endorse, suspend or cancel the certificate.

(3) The Director-General or any officer authorised by him in this behalf may require the holder of a certificate of competency to produce the same for endorsement under sub-rule (2), and the holder shall comply with such requisition.

14. Nothing in these rules shall apply to the use of a wireless telegraph for the purpose of making or answering signals of distress.

THE FIRST SCHEDULE.

(*See Rule* 8.)

LICENSE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATIONS.

In these presents (and in the Table annexed hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject

or context repugnant to such construction (that is to say):

The expression "The Director-General of Posts and Telegraphs" means the Director-General of Posts and Telegraphs, India, for the time being.

The expression "the Telegraph Act" means the Indian Telegraph Act, 1885 (XIII of 1885).

The word "telegraph" has the same meaning as in the Telegraph Act.

The expression "the Rules" means the Rules made from time to time under the Telegraph Act.

The expression "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval station and any other wireless telegraph station whether a coast station or a ship station.

The expressions "the International Telegraph Convention" and "the International Telegraph Regulations" mean respectively the International Convention of St. Petersburg dated 10th-22nd July, 1875, and the Service Regulations made thereunder and include respectively any modification of the said Convention or Regulations made from time to time.

The expression "the Radiotelegraph Convention, 1912" means the International Radiotelegraph Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The expression "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

Apparatus shall be deemed to be "syntonised" when the transmitting apparatus is so adjusted as to communicate with a receiver which has a corresponding adjustment, and to produce as little effect as possible on a receiver not having a corresponding adjustment.

Whereas of hereinafter called "the licensee" is desirous of establishing, maintaining and working on the ships belonging to the licensee, specified in the Table annexed hereto, wireless telegraphy under section 4 of the Indian Telegraph Act, 1885 (XIII of 1885):

And whereas by reason of the provisions of the said Telegraph Act it is unlawful to establish, maintain or work any apparatus for wireless telegraphy on board any ship registered in British India except under and in accordance with rules made in that behalf by the Governor-General of India in Council;

And whereas the licensee has requested the Governor-General in Council to grant to the licensee the licenses, powers, and authorities hereinafter expressed and contained for the period, upon the terms and subject to the stipulations and conditions hereinafter appearing;

Now the Governor-General in Council in exercise of all powers and authorities enabling him in this behalf hereby grants to the licensee during the term or period commencing on the day of the date hereof, and terminating on the 31st day of December, 19 , license and permission—

(i.) To establish, maintain and work for the purposes hereinafter mentioned at the ship stations specified in the Table annexed hereto and at such other ship stations as may be specified in any Supplemental license given from time to time under the hand of the Director-General of Posts and Telegraphs, but subject in all respects to the Rules, apparatus for wireless telegraphy of the kind used in the system known as the
system of wireless telegraphy.

Provided that—

(*a*) the apparatus installed at each ship station shall be of the character specified in the said Table opposite to the name of such station or in any such supplemental license as aforesaid;

(*b*) the apparatus used at all of the said ship stations shall be syntonised;

(*c*) the licensed apparatus shall be so constructed as to be capable of using wavelengths of 300 and 600 metres in length as measured by the standard of measurement in use for the time being by the Government of India and such other wavelengths not exceeding 600 metres in length as shall be authorised in writing from time to time by the Director-General of Posts and Telegraphs;

Provided that only wavelengths of 600 metres shall be used by the licensee during the period of any war in which the United Kingdom is engaged;

(*d*) the apparatus shall admit of the transmission and reception of messages at the rate of not less than twenty words a minute, five letters being counted as one word;

(ii.) to transmit and receive messages by means of the licensed apparatus between the said ship stations and between the said ship stations and coast stations and other ship stations. Provided that the transmission and receipt of messages from and at the said ship stations when in any harbour in India shall be subject to such conditions and restrictions as the Governor-General in Council may prescribe from time to time; and

(iii.) to receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus:

And it is hereby declared that the said license and permission is granted on and subject to the following further conditions and provisions:—

1. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the transmission or receipt of messages except messages authorised by this license.

2. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling.

(2) If the Governor-General in Council is of opinion that the working of the licensed apparatus at any ship station specified in the Table annexed hereto or in any such Supplemental License as aforesaid is inconsistent with the free use of Naval signalling the licensee shall, when required in writing by the Director - General of Posts and Telegraphs so to do, close the said station; the making

of such a requisition shall be conclusive evidence of the opinion of the Governor-General in Council to the effect aforesaid.

(3) These provisions for the protection of Naval signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

3. For the purpose of this license the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

4. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912.

5. The licensee shall comply with all such directions and observe all such rules and regulations as may be given or made by the Director-General of Posts and Telegraphs from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

6. The licensed apparatus shall not, without the consent of the Director-General of Posts and Telegraphs, be altered or modified in respect of any of the particulars mentioned in the Table annexed hereto or in any such Supplemental License as aforesaid.

7. The licensee shall at all times indemnify the Governor-General in Council against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

8. (1) Subject to the provisions of this license and of the Rules the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or precedence whether as regards rates of charge order of transmission or otherwise.

(2) In respect of the messages transmitted on behalf of His Majesty's Government the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

9. The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

10. The licensed apparatus at the said ship stations shall be worked only by a person or persons holding a certificate or certificates of competency issued by the Director-General of Posts and Telegraphs or by the proper authority in the United Kingdom, or in any British Possession or Protectorate.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government of India or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and transmitted by Naval signalling or by any system of wireless telegraphy provided or maintained by or for the purposes of the different Departments of the Government of India, or by any other licensee of the Government of India.

12. (1) The licensee shall keep full accounts, records and registers of all messages transmitted by means of the licensed apparatus, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination and such further particulars as the Director-General of Posts and Telegraphs shall from time to time reasonably require to be shown, messages on the service of the Government of India being in such registers distinguished from other messages.

(2) The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for a period of at least fifteen months counting from the month following that in which the radiotelegrams were handed in as prescribed by the Radiotelegraph Convention, 1912, and in default of any provisions on the subject in the said Convention for such period as is from time to time prescribed by the International Telegraph Regulations and such registers and message papers shall be open to the inspection of the Director-General of Posts and Telegraphs or his officers thereto authorised at the office of the licensee in between the hours of 10 a.m. and 5 p.m., on every day except Sunday or a statute or general holiday.

13. The licensee shall render to the Director-General of Posts and Telegraphs such accounts as the Director-General shall from time to time direct in respect of all charges due or payable under the Radiotelegraph Convention, 1912, in respect of messages exchanged between the ship stations hereby licensed and coast stations and shall pay to the Director-General at such times and in such manner as he shall direct all sums which shall be due from the licensee in accordance with such accounts.

14. The Director-General of Posts and Telegraphs and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the ship stations mentioned in the said Table for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the method of working and user of such apparatus and telegraphic instruments, respectively.

15. The licensee shall carry on every ship mentioned in the said Table on which a ship station is established a print or copy of the licence and supplemental license if any certified under the hand of an officer authorised for that purpose by the Director-General of Posts and Telegraphs to be a true copy and also such documents as may be prescribed by the Director-General of Posts and Telegraphs for the purpose of enabling the licensee to communicate with coast stations in accordance with the Radiotelegraph Convention, 1912.

16. Except with the consent in writing of the Governor-General in Council the licensees shall not assign, underlet or otherwise dispose of, or admit any other person or body to participate in the benefit of the licenses, powers and authorities hereby granted or any of such licenses, powers or authorities.

17. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that the Governor-General in

Council shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the Director-General or any other officer specially authorised by him to cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf of the Governor-General in Council and to be used for the service of the Government and subject thereto for such ordinary services as to the said officer may seem fit and in that event any person authorised by the said officer may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid.

(2) Any such officer may in such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may accordingly enter upon any ship on which any such apparatus is installed and assume such control or the said officer may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages, to stop or delay the transmission of any messages, or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

18. The Governor-General in Council may at any time by notice in writing but without assigning any reason revoke and determine these presents and the licenses, powers and authorities hereinbefore granted and each and every of them as to all or any of the ship stations hereby licensed and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void as to all or any of the said ship stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Government of India under any condition or provision herein contained.

19. Nothing in these presents contained shall prejudice or affect the right of the Governor-General in Council, from time to time, to establish, extend, maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit; neither shall anything herein contained prejudice or affect the right of the Governor-General in Council from time to time and at any time to enter into agreements for or to grant licenses relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of British India or Indian Waters by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor-General in Council by or under the Telegraph Act.

20. Any notice, request or consent (whether required to be in writing or not) to be given by or on behalf of the Governor-General in Council under these presents may be under the hand of the Director-General of Posts and Telegraphs and may be served by sending the same in a registered letter addressed to the licensee at the office for the time being of the licensee, or if such notice, request or consent relates to any particular ship station, by delivery to the master of the ship upon which such station is installed; and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Director-General of Posts and Telegraphs.

Signed, sealed and delivered by Director-General of Posts and Telegraphs for and in the name and as the act and deed of the Governor-General in Council in the presence of }

Other particulars :—

THE SECOND SCHEDULE.

(*See Rule* 13.)

F CONDITIONS FOR THE GRANTING OF CERTIFICATES OF COMPETENCY AS WIRELESS TELEGRAPH OPERATOR ON BOARD SHIPS, REGISTERED IN BRITISH INDIA.

1. Certificates of competency as wireless telegraph operator on board ships registered in British India shall be granted by the Director-General subject to an examination, shall be issued in Form B annexed hereto, shall indicate the system or systems of radiotelegraphy in which the holder's examination was conducted, and shall certify that the holder—

(*a*) in the case of first-class certificates, is able to send and receive, by sound, messages in plain language in the International Morse Code at a rate of not less than 20 words per minute (five letters being counted as one word); or

(*b*) in the case of second-class certificates is able to send and receive, by sound, messages in plain language in the International Morse Code at a rate of from 12 to 19 words per minute (five letters being counted as one word); and

(*c*) is able to adjust the apparatus ordinarily used in some well-known system of wireless telegraphy so as to suit the varying conditions of working, without using excessive transmitting power; and

(*d*) has an efficient working knowledge of the regulations applicable to the exchange of radiotelegraphic traffic.

2. (1) Candidates at an examination will be expected—

(*a*) to send on an ordinary Morse Key for five consecutive minutes at not less than the prescribed speed. The accuracy of signalling, the correct formation of the letters, and the correctness of spacing shall be taken into account;

(*b*) to receive and write legibly at the prescribed speed from a double headgear

TABLE OF LICENSED SHIP STATIONS.

Name of Ship on which Station Established.	Normal Range of Signalling in Nautical Miles.		Character of Apparatus.		Power.			If Alternator is used Number of Cycles per Second.
	By Night.	By Day.	Description of Receiving Apparatus.	Wave-lengths in Metres.	Source and Maximum Output.	Maximum taken by Transmitting Instruments. Current	Voltage	
1.	2.	3.	4.	5.	6.	7.	8.	9.

telephone receiver as ordinarily used for radiotelegraphic reception;

(*c*) to understand simple diagrams of the electrical connections of the apparatus used in the system in which he is being examined;

(*d*) to be able to connect up the apparatus with the help of such diagrams so far as this is required in the system in which he is being examined;

(*e*) to name the principal parts of the apparatus and indicate their use;

(*f*) to mention the most common faults, and the means usually taken to remedy them in the system in which he is being examined;

(*g*) to explain the steps taken to change from one wavelength to another, in sending and receiving, in the system in which he is being examined.

(2) The practical examination shall embrace he following:—

(*a*) Connecting up the apparatus.
(*b*) Operating (sending and receiving).
(*c*) Regulating and adjusting.
(*d*) Altering the wavelength.
(*e*) Reducing or increasing the transmitting power.
(*f*) Tracing and clearing faults.

(3) The examination in regard to the actual transmission of messages shall be based upon the rules contained in the handbook published by the Director-General.

3. Candidates for examination shall fill up an application in Form A annexed hereto and submit the same to the Director-General at Calcutta. The date and place of examination shall be notified to the candidate as soon as possible after receipt of the application.

If the candidate be successful in his examination he will sign the photograph in the presence of the Examining Officer. The Examining Officer will at the same time take the age, place and date of birth and the description of the candidate from the latter's application in Form A.

The photograph will be affixed to the back of the certificate in the office of the Director-General of Posts and Telegraphs and stamped with a special date stamp overlapping photograph and certificate.

The particulars of the description of the candidate as also his age, and date and place of birth will be entered on the back of the certificate.

The certificate will then be sent to the operator by post.

The photograph and description will be checked by the Port Authorities when the operator is signing on a ship. If the operator has not already signed his name in the space provided for that purpose on the front of the certificate he will do so in the presence of the Port authorities.

4. Candidates for examination shall pay an examination fee of Rs. 5 by means of postage stamps affixed to the form of application.

5. Examinations of persons desirous of obtaining certificates of competency referred to in Condition 1 shall ordinarily be conducted at Calcutta. Special arrangements may be made, where circumstances permit, for holding an examination at any wireless station at which suitable apparatus is provided for the purpose.

6. If the candidate satisfactorily passes the examination, he shall make a declaration that he will observe the secrecy of radiotelegrams which come to his knowledge in the course of duty.

7. In case of failure at an examination a candidate shall not ordinarily be re-examined until after the lapse of three months. An additional fee of Rs. 5 shall be payable in respect of the further examination.

BRITISH NORTH BORNEO

(See BORNEO, BRITISH.)

BRITISH SOMALILAND

THE Somali coast, lying south of the Red Sea, and stretching from Lahadu to Bandar Ziyava (49° east longitude), is administered by a British Governor. Egyptian control ceased in 1884, and the territory then fell under the administration of the Indian Government. It was taken over by the Foreign Office on October 1st, 1898, and was transferred to the Colonial Office on April 1st, 1905. The area comprises about 68,000 square miles, which support a population of about 300,000 Mohammedans, mainly nomadic, except on the coast, where British occupation has brought into existence some fair-sized towns supporting an urban population. The boundary has been settled by agreement between France, Italy, and Abyssinia. The chief ports are Berbera, Bulhar, and Zeila.

CONTROL.

The control of wireless telegraph operations is vested in the Posts and Telegraphs Department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. C. R. Keyte	Director, Posts and Telegraphs	Berbera.
Mr. C. V. Magill	Assistant Director of Posts and Telegraphs ..	Do.
Mr. A. J. S. Culpeper ..	Superintendent of Telegraphs	Do.
Mr. O. L. Day	Electrical Mechanic	Do.

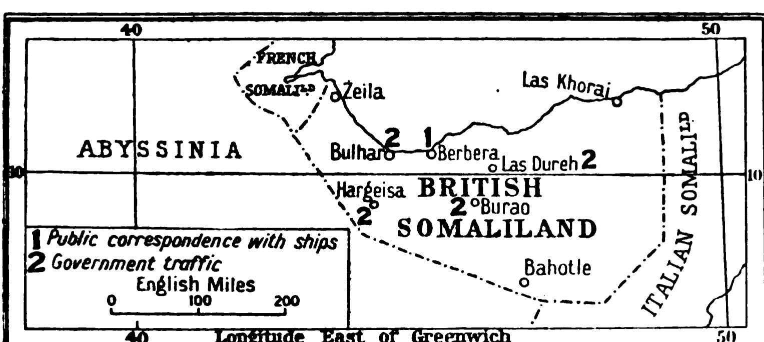
ORGANISATION.

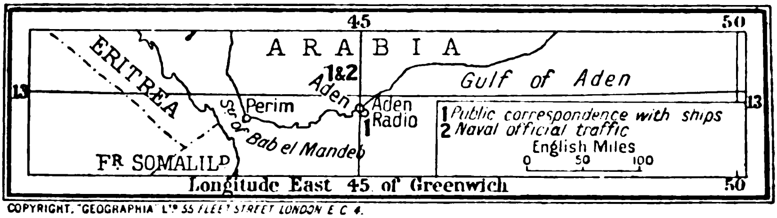
Originally radiotelegraphy was introduced, and the Protectorate placed in telegraphic communication with the outside world, more with a view to administrative than commercial purposes. The first stations were erected in 1910 at Berbera and Aden (on the Asiatic coast), the latter being in telegraphic communication with the Eastern Telegraph Company's Aden Station. Subsequently other stations were erected, at Bulhar (1913), at Burao (1916), at Las Dureh (1918), and at Hargeisa (1919).

Burao is military headquarters, Las Dureh is an outpost station on the edge of Mullahs country and proved most useful by giving the camel corps information of a dervish raid which enabled the retreat to be cut off. Las Dureh communicates directly with Berbera and Burao.

A new station has been erected at Hargeisa, 110 miles S.W. of Berbera, for interior working. Hargeisa is a District Commissioner's headquarters which is now in direct communication with Berbera and Burao.

Bulhar station has been temporarily closed.





Mobile stations are projected for Zeila and Las Khorai on the coast.

The latest available statistics enumerate: Six land stations (including Aden) (fixed) directly controlled by Government, and one portable land station (a ½ kw. camel pack set) also under Government control. Internal communication is on a 900-metre wave to avoid interference in the Gulf of Aden.

ADMINISTRATION.

The first Ordinance to regulate radiotelegraphy in the Somaliland Protectorate was passed in 1908. It was called Ordinance No. 6 of 1908, and enacted that the full control of radiotelegraphy should be vested in the Commissioner, and any person contravening his regulations should be liable on conviction to a fine not exceeding £100 or imprisonment for 12 months, together with confiscation of his apparatus. A new Ordinance repealing the above was passed in 1913, and appears *in extenso* below. This constitutes the extant governing decree under which wireless is at present administered.

We append the text of the following :—

A—Wireless Telegraphy Ordinance, 1913.
B—Regulations thereunder.

ORDINANCE.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which messages or other communications are sent or received. Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Protectorate, except under and in accordance with a license granted in that behalf by the Commissioner.

(2) Every such license shall be in such form and for such period as the Commissioner may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Protectorate, otherwise than in accordance with regulations under this Ordinance.

5. (1) The Commissioner may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication have the same effect as if enacted in this Ordinance.

(2) The regulations in the schedule to this Ordinance shall have effect in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Commissioner, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Protectorate shall be subject to such further regulations as may be made by the Commissioner from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance, or of any license granted under this Ordinance, he may grant a search-warrant to any Police Officer or any person appointed in that behalf by the District Commissioner and named in the warrant, and a warrant so granted shall authorise the Police Officer or person named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to fine not exceeding rupees seven hundred and fifty, and upon such conviction the Court

may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before the District Court, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphs Ordinance, 1908, is hereby repealed.

SCHEDULE.—Section 5 (2).

Regulations.

B i. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Protectorate shall be worked in such a way as not to interfere with—

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Protectorate or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless stations established on ships at sea.

ii. In these regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

iii. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Protectorate, except with the special or general permission of the Commissioner.

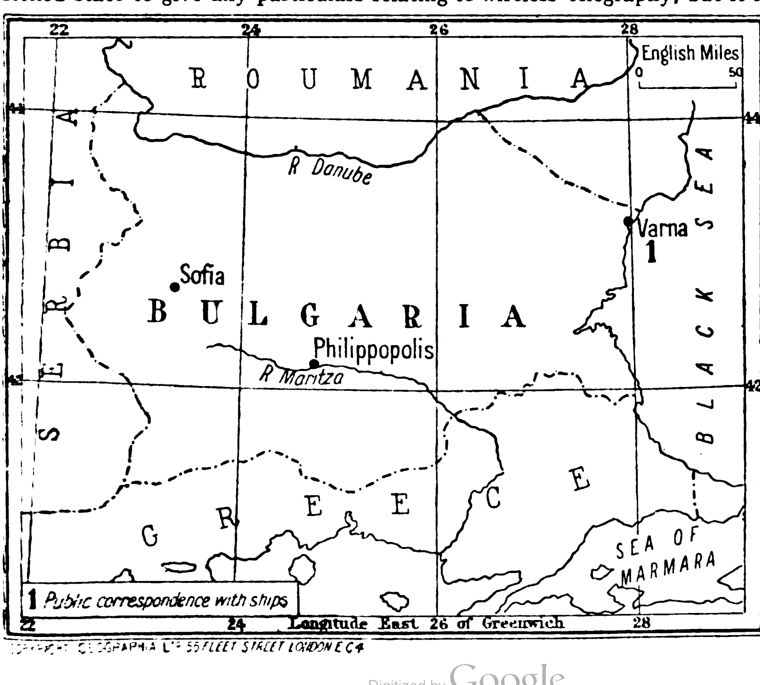
iv. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

v. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

vi. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

BULGARIA

BULGARIA, until the advent of the late war, constituted one of the most important of the Balkan States It is not yet in a sufficiently settled state to give any particulars relating to wireless telegraphy, but it is



hoped in our next issue that it may be possible to print the text of any laws or regulations governing the administration of wireless in that country.

CONTROL.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. Nicholas Startcheff ..	Director General of Posts, Telegraphs and Telephones.	Sofia.

As far as is known only one fixed station exists, viz., at Varna, and this communicates with ships.

BURMA

(See BRITISH INDIA.)

CANADA

THE Dominion of Canada possesses a land area of 3,603,910 miles. It was originally discovered by Cabot, in 1497, then settled by the French in the seventeenth century, and finally annexed to the British Empire in 1763. Its establishment as a Dominion dates from July 1st, 1867. The executive power is vested in a Governor-General appointed by the Sovereign and aided by a Privy Council.

CONTROL.

The Marconi Company is the only commercial concern manufacturing and operating wireless telegraph apparatus in Canada.

Official.	*Title.*	*Address.*
The Hon. C. C. Ballantyne ..	Minister of Marine and of the Naval Service	Department of the Naval Service, Ottawa.
Mr. G. J. Desbarats, C.M.G. ..	Deputy Minister of the Naval Service	Department of the Naval Service, Ottawa.
Lieut.-Commander C. P. Edwards, O.B.E. ..	Director, Government Radiotelegraph Service	Department of the Naval Service, Ottawa.
Mr. W. A. Rush	Division Superintendent, East Coast and Central Canada ..	Department of the Naval Service, Ottawa.
Mr. E. J. Haughton	Division Superintendent, Pacific Coast	Old Post Office Building, Victoria, B.C.
Mr. J. H. Thompson	Chief Engineer, Government Radiotelegraph Service ..	Department of the Naval Service, Ottawa.
Mr. L. W. Stephenson ..	District Engineer, Pacific Coast	Old Post Office Building, Victoria, B.C.
Mr. D. Manson	Chief Radiotelegraph Examiner	Department of the Naval Service, Ottawa.
Mr. J. D. Taylor	East Coast Radio Officer and District Engineer	H.M.C. Dockyard, Halifax, N.S.
Mr. J. M. Colton	Inspector for Port of Montreal	Old Customs Building, Montreal, P.Q.
Mr. W. Howard	Pacific Coast Inspector ..	Old Post Office Building, Victoria, B.C.
Mr. J. A. Holmes	Chief Traffic Officer	Department of the Naval Service, Ottawa.

ORGANISATION.

According to the latest available information there are 904 radiotelegraph installations classified as follows :—

Coast Stations	44
Government Ship Stations	45
Licensed Ship Stations	181
Licensed Public Commercial Stations	6
Licensed Private Commercial Stations	12
Licensed Radiotelegraph Schools	18
Licensed Experimental Stations	11
Licensed Amateur Experimental Stations	582
Direction Finding Stations	4
Limited Coast Stations, Licensed	1
Total	904

The first radiotelegraph stations in Canada were erected by the Marconi Telegraph Company of London, England, for the Government at Chateau Bay and Belle Isle in the Straits of Belle Isle in the year 1901, and were probably the first radiotelegraph stations ever established for the specific purpose of replacing an existing cable.

In 1904 a properly organised chain of coast stations was built for the Canadian Government by the Marconi Wireless Telegraphy of Canada, Limited, in the Gulf of St. Lawrence, and has since been extended until it reaches from Port Arthur, at the head of Lake Superior, to the sea, and now consists of 23 coast stations and 4 direction finding stations.

The work on Hudson Bay railroad and terminals having been suspended, the two medium power stations at Le Pas and Port Nelson, Manitoba, have been temporarily closed, and construction work on a medium power station at Mansel Island, at the western end of Hudson Straits, has been suspended.

The fourth direction finding station on the East Coast was installed at Red Head, at the entrance to St. John, N.B., harbour, and was placed in commission in February, 1921.

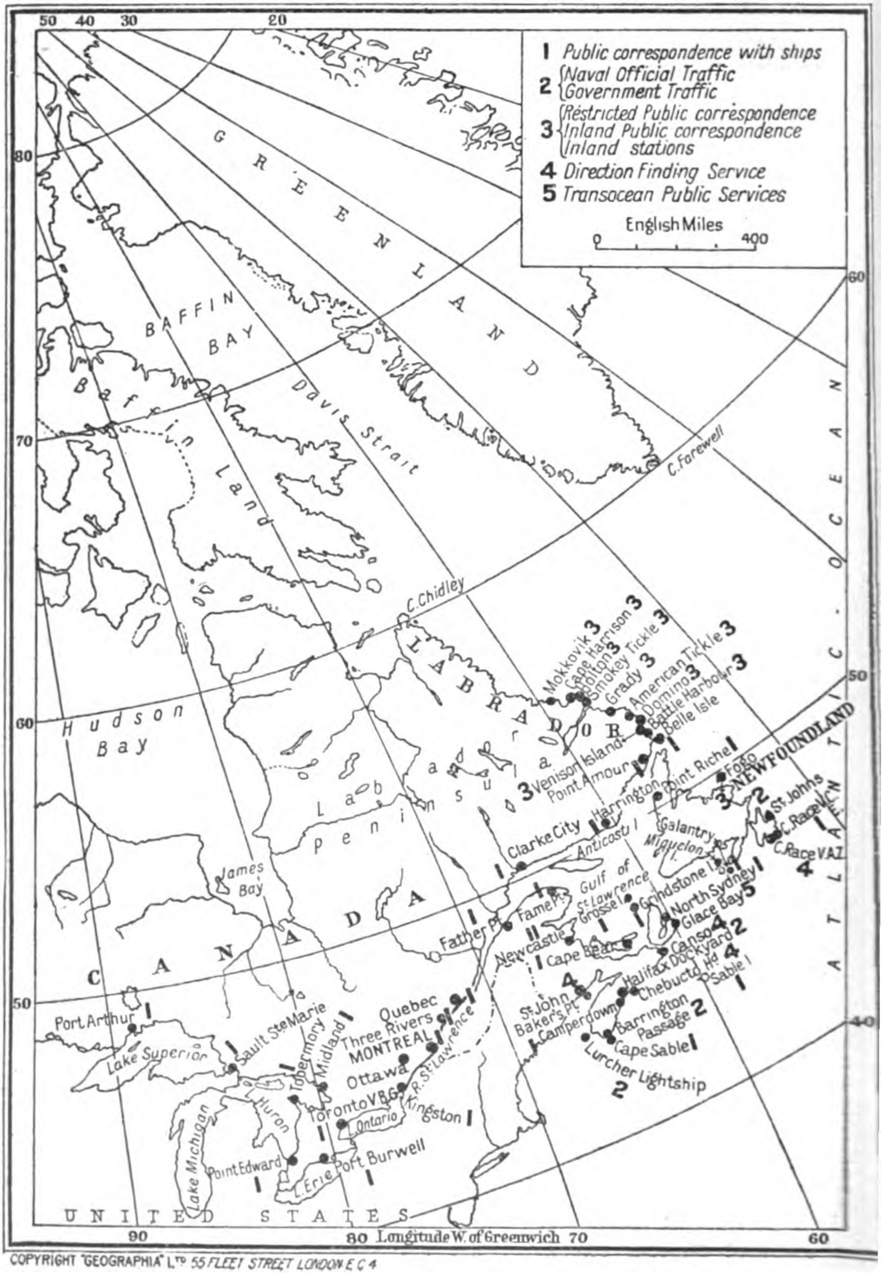
Long distance service to ships fitted with C.W. apparatus is provided by the Government station at Barrington Passage, N.S. This station also maintains commercial service with the Admiralty station at Bermuda in competition with the Halifax-Bermuda cable,

A ground station for aircraft has been established and is now in operation at the Air Depôt, High River, Calgary, and is being used in connection with the air forestry patrol in that district.

The discovery of oil at Fort Norman, in the north-west territory, approximately one thousand miles form civilization, and the great influx of prospectors into that territory, has brought the matter of the lack of communication with that area very much to the fore, and it is anticipated that a chain of radiotelegraph stations extending from Edmonton north will be installed either by the Government or by private enterprise to provide the desired facilities.

Transatlantic service continues to be maintained by the Marconi stations at Glacé Bay, C.B., and Clifden, and it is worthy of remark that while this was the original circuit to be established, it still continues to set the pace for all the other transatlantic services, in so far as traffic efficiency is concerned.

The second Canadian transatlantic station (Poulsen Arc System) at Newcastle, N.B., which was installed to communicate with a similar station at Ballybunion, Ireland, and which has since passed under control of the affiliated Marconi companies, has not yet been placed in operation commercially.


1 Public correspondence with ships
2 Naval Official Traffic
Government Traffic
3 Restricted Public correspondence
Inland Public correspondence
Inland stations
4 Direction Finding Service
5 Transocean Public Services
English Miles
0 400
GREENLAND
BAFFIN BAY
Baffin Land
Davis Strait
C. Farewell
C. Chidley
Hudson Bay
LABRADOR
Labrador Peninsula
James Bay
CANADA
NEWFOUNDLAND
ATLANTIC OCEAN
Mokkovik 3
Cape Harrison 3
Bolton 3
Smokey Tickle 3
Grady 3
American Tickle 3
Domino 3
Battle Harbour 3
Belle Isle
Venison Island
Point Amour
Harrington
Point Riche
Fogo
St. Johns
C. Race VCN
C. Race VAJ
Clarke City
Anticosti I.
Galantry
Miquelon
Gulf of St. Lawrence
Grosse I.
Grindstone I.
North Sydney
Glace Bay 5
Canso
Dockyard
Halifax
Chebucto Hd.
Sable I.
Fame Pt.
Father Pt.
Newcastle
Cape Bear
St. John
Baker's Pt.
Camperdown
Barrington Passage
Cape Sable
Lurcher Lightship
Quebec
Three Rivers
MONTREAL
Ottawa
R. St. Lawrence
Kingston
Toronto VBG
L. Ontario
Port Burwell
L. Erie
Point Edward
Tobermory
Midland
L. Huron
Lake Michigan
Sault Ste Marie
Lake Superior
Port Arthur
UNITED STATES
Longitude W. of Greenwich

Projects for the establishment of a high power station on the Pacific Coast for transpacific communication remain in the tentative stage.

Considerable improvements are being effected in the West Coast chain of coast stations owned and operated by the Government. The chain has been reorganized into two circuits extending up and down the coast, one to handle ship traffic on 600 metres, and the other ordinary telegraphic business on C.W.

The main coast station for working with transpacific ships will be Estevan, which is now in course of enlargement, and a new C.W. station is to be erected at Vancouver to act as terminal station for the inter-station group.

On the East Coast several of the old coast stations are being closed down, viz., Heath Point, Cape Ray, Pictou and Partridge Island. Next year further redundant stations will be closed as soon as the apparatus at the remaining stations has been improved in order that the efficiency of the service as a whole may not be impaired.

Work is now in progress on a new coast station at Montreal to replace the existing station on the Tarte Pier at the entrance to Montreal harbour. As soon as this station is put in commission the station at Three Rivers will be closed.

The Heath Point Lightship is being equipped, and will take the place of the old station at Heath Point in so far as giving local information regarding weather, ice, etc., is concerned.

The service heretofore given by Partridge Island will in future be given by the improved St. John station, located at Red Head, at the entrance to St. John Harbour.

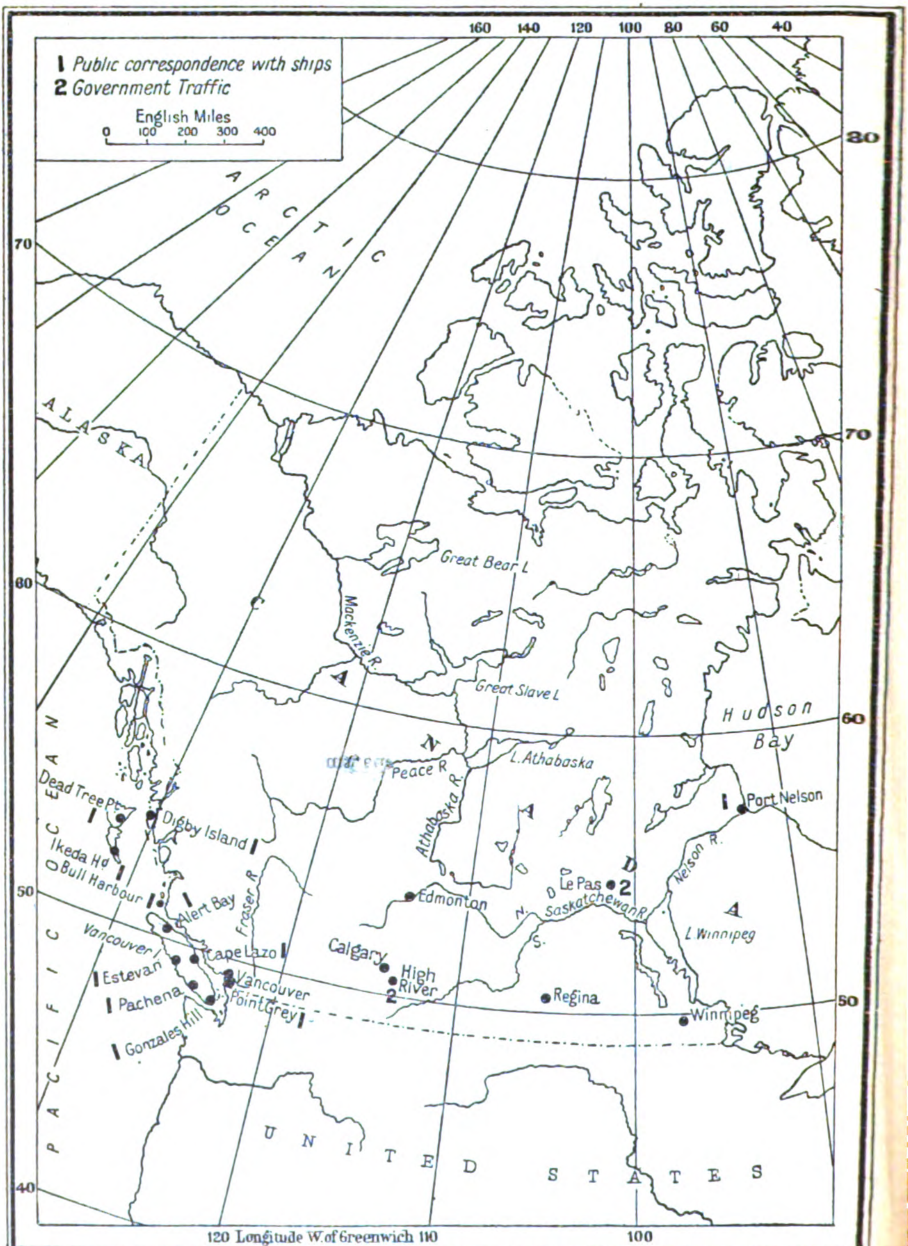
The Department requires that all those entering the Radiotelegraphic Service as operators should pass a proficiency examination to determine their qualifications prior to acceptance, and announces that applications for entry as operators in the Radiotelegraph Service should be addressed to—

"The Deputy Minister,
Naval Service Department,
Ottawa."

ADMINISTRATION.

Radiotelegraphy in the Dominion was, until 1913, regulated by a section of the Telegraphs Act. This is now replaced by the Act which was assented to on June 6th, 1913, and revised in February, 1920. This is reprinted in the following pages. As matters at present stand, we may usefully divide the rules governing the administration and procedure as far as wireless telegraphy is concerned into the following :—

A—The Radiotelegraph Act, Chapter 43 of the 1913 Statute.
B—Regulations issued by the Governor-in-Council.
C—Regulations issued by the Minister of the Naval Service.
D—Extract from Air Regulations, 1919.
E—Limited coast station license.
F—Public commercial license.
G—Private commercial license.
H—Experimental license.
I—Amateur experimental license.
J—Ship license.
K—Training school license.
L—Circular to shipmasters.


I Public correspondence with ships
2 Government Traffic
English Miles
0 100 200 300 400
ARCTIC OCEAN
ALASKA
PACIFIC OCEAN
CANADA
UNITED STATES
Hudson Bay
Great Bear L
Great Slave L
Mackenzie R.
Peace R
L. Athabaska
Athabaska R.
Nelson R.
Saskatchewan R.
L. Winnipeg
Fraser R.
Port Nelson
Dead Tree Pt
Digby Island
Ikeda Hd
Bull Harbour
Alert Bay
Vancouver I.
Cape Lazo
Estevan
Pachena
Vancouver
Point Grey
Gonzales Hill
Calgary
High River
Edmonton
Le Pas
Regina
Winnipeg
120 Longitude W. of Greenwich 110
100

AN ACT RESPECTING RADIOTELEGRAPHY STATUTES, 1913, CHAPTER 43.

His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. This Act may be cited as the Radiotelegraph Act.

2. In this Act, unless the context otherwise requires—

(*a*) "Minister" means the Minister of the Naval Service;

(*b*) "radiotelegraph" includes any wireless system for conveying electric signals or messages including radiotelephones;

(*c*) "coast station" means any radiotelegraph station which is established on land or on board a ship permanently moored and which is used for the exchange of messages and electric signals with ships at sea;

(*d*) "land station" means any radiotelegraph station or installation of radiotelegraphic apparatus which is not a coast station or a ship station;

(*e*) "ship station" means any radiotelegraph station established on board a ship which is not permanently moored.

3. No person shall establish any radiotelegraph station or instal or work any radiotelegraph apparatus in any place in Canada or on board any ship registered in Canada except under and in accordance with a license granted in that behalf by the Minister.

4. From and after the first day of January, nineteen hundred and fourteen, no passenger steamer, whether registered in Canada or not—

(*a*) licensed to carry fifty or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than two hundred nautical miles from one port or place to another port or place; or,

(*b*) licensed to carry two hundred and fifty or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than ninety nautical miles from one port or place to another port or place; or,

(*c*) licensed to carry five hundred or more persons, including passengers and crew, and going on any voyage which is or which includes a voyage of more than twenty nautical miles from one port or place to another port or place

shall leave or attempt to leave any Canadian port unless such steamer is equipped with an efficient radiotelegraph apparatus, in good working order, capable of transmitting and receiving messages over a distance of at least one hundred nautical miles by night and by day, and in charge of a person fully qualified to take charge of and operate such apparatus.

2. The owner, master or other person in charge of any passenger steamer which leaves or attempts to leave any Canadian port contrary to the provisions of this section shall, on summary conviction, be liable to a fine not exceeding one thousand dollars and costs, and such fine and costs shall constitute a lien upon such passenger steamer.

(3) This section shall not apply to passenger steamers plying on the rivers of Canada, including the River St. Lawrence as far seaward as a line drawn from Father Point to Point Orient, or on the Northumberland Straits, or on the Georgian Bay, or on the lakes of Canada other than Lakes Ontario, Erie, Huron and Superior, and the provisions of paragraph (*c*) of sub-section 1 of this section shall not apply to steamers making voyages on Lakes Ontario, Erie, Huron and Superior, the regular route for which is not at any point more than seven miles from the shore.

(4) This section shall not apply to steamers calling at Canadian ports solely for the purpose of obtaining bunker coal or provisions for the use of such steamer, or through stress of weather, or for repairs.

5. All persons operating land or cable telegraph lines shall transmit all messages destined to or coming from ship stations via coast stations under such rules as may be made by the Board of Railway Commissioners for Canada.

6. No one shall be employed as a radiotelegraph operator at any coast or land station unless he is a British subject, and all radiotelegraph operators at shore or land stations, or on ship stations on board any vessel registered in Canada, shall take and subscribe a Declaration of Secrecy in the form set forth in the Schedule to this Act, before a judge of any court, a notary public, a justice of the peace or a commissioner for taking affidavits, having authority or jurisdiction within the place where the oath is administered.

(2) Every person who has made the Declaration of Secrecy and who, either directly or indirectly, divulges to any person, except when lawfully authorised or directed so to do, any information which he acquired by virtue of his employment, is guilty of an offence and shall be liable on summary conviction to a penalty not exceeding one hundred dollars and to imprisonment for a term not exceeding six months.

7. Any person who sends or transmits or causes to be sent or transmitted any false or fraudulent distress signal, message, call or radiogram of any kind, or who without lawful excuse interferes with or obstructs any radio-communication, shall be guilty of an offence and shall be liable on summary conviction to a penalty not exceeding five hundred dollars and costs or six months' imprisonment.

8. If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that a radiotelegraph station has been established without license in that behalf, or that any apparatus for radiotelegraphy has been installed or worked in any place or on board any ship registered in Canada within his jurisdiction without a license in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Minister and named in the warrant.

(2) A warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship and to seize any radiotelegraph apparatus which appears to him to be there used or intended to be there used for radiotelegraphy.

9. Every one who establishes a radiotelegraph station or instals or works any radiotelegraph apparatus in violation of the provisions of this Act, or of any regulation made hereunder, shall be liable on summary conviction to a penalty not exceeding fifty dollars, and on conviction on indictment to a fine not exceeding five hundred dollars and to imprisonment for a term not exceeding twelve months, and in either case shall be liable to forfeit to His Majesty, any radiotelegraph apparatus installed or worked without a license.

(2) No proceedings shall be taken against any

person under this section, except by order of the Minister.

10. The Governor in Council may—

(*a*) prescribe the tariff of fees to be paid for licences and for examination for certificates of proficiency held and issued under the provisions of this Act;

(*b*) accede to any international convention in connection with radiotelegraphy, and make such regulations as may be necessary to carry out and make effective the terms of such convention and prescribe penalties recoverable on summary conviction for the violation of such regulations; provided that such penalties shall not exceed five hundred dollars and costs;

(*c*) make regulations for the censorship and controlling of radiotelegraph signals and messages in case of actual or apprehended war, rebellion, riot or other emergency.

11. The Minister may make regulations—

(*a*) prescribing the form and manner in which applications for licenses under this Act are to be made;

(*b*) classifying ship, coast and land stations and prescribing the type and range of the regular equipment and the emergency equipment to be installed in the several classes of stations;

(*c*) defining the different kinds of licenses that may be issued, their respective forms and the several periods for which they shall continue in force;

(*d*) prescribing the conditions and restrictions to which the several licenses shall respectively be subject;

(*e*) prescribing the different classes of certificate of proficiency and the class of certificate necessary to qualify persons as operators for the several classes of ship, coast and land stations;

(*f*) for the examination of persons desiring to obtain certificates of proficiency as radiotelegraph operators and to determine the qualifications in respect of age, term of service, skill, character and otherwise to be required for such certificates;

(*g*) prescribing the watches to be kept by operators and the number of operators to be maintained and kept at the different classes of ship, coast and land stations;

(*h*) for the inspection of radiotelegraph stations;

(*i*) to provide how radiotelegraph apparatus installed upon any foreign or British ship (whether such British ship is registered in Canada or elsewhere) shall be operated while such ship is within the territorial waters of Canada;

(*j*) to compel all radiotelegraph stations to receive, accept, exchange and transmit signals and messages with such other radiotelegraph stations and in such manner as he may prescribe

(*k*) for the effective carrying out of the provisions of this Act.

(2) The Minister may, by regulation, authorise the imposition of a penalty not exceeding fifty dollars and costs or three months' imprisonment for the violation of any regulation made under this section, and any such penalty may be recovered upon summary conviction.

12. All regulations made under the provisions of the two sections immediately preceding shall be published in *The Canada Gazette*, and shall be laid before both Houses of Parliament within ten days after the publication thereof if Parliament is then sitting, and if Parliament is not then sitting, then within ten days after the next meeting thereof.

13. His Majesty may, at any time, assume, and for any length of time retain, possession of any radiograph station and of all things necessary to the sufficient working thereof, and may, for the same time, require the exclusive service of the operators and other persons employed in working the same; and the person owning or controlling the station shall give up possession thereof, and the operators and other persons so employed shall, during the time of such possession, diligently and faithfully obey such orders, and transmit and receive such signals, calls and radiograms as they are required to receive and transmit by any duly authorised officer of the Government of Canada.

(2) If the Minister and the person owning or controlling any radiotelegraphic station taken possession of by the Crown under the provisions of this section cannot agree as to the compensation to be paid by the Crown for such taking possession, the Minister shall refer the matter to the Exchequer Court of Canada for adjudication.

14. Part IV of the Telegraphs Act is repealed.

SCHEDULE.

Declaration of Secrecy.

I, A. B. solemnly and sincerely promise and declare that I will faithfully and honestly fulfil the duties which devolve upon me as radiotelegraphic operator, and that I will not, either directly or indirectly, divulge to any person, except when lawfully authorised or directed so to do, any information which I acquire by virtue of my employment as such operator, or which may come to my knowledge through the operation of any radiotelegraphic installation.

Declared before me at
this day of 19

[*Signature of declarant.*]

REGULATIONS.

Approved by the Governor in Council and issued in Accordance with Section 10 of the Radiotelegraph Act, Chapter 43, Statutes, 1913.

Fees for Licenses.

1. The annual fees to be paid in respect of licenses issued by the Minister of the Naval Service, for the installation and operation of radiotelegraph stations in the Dominion of Canada, or on board any ship registered in Canada, shall be as follows:—

1. Limited Coast stations	$10.00
2. Public Commercial stations ..	50.00
3. Private Commercial stations ..	10.00
4. Experimental stations	5.00
5. Amateur Experimental stations ..	1.00
6. Technical or Training School stations	1.00
7. Ship stations	1.00

Fees for Examinations.

2. The fees to be paid in respect of examinations for "Certificates of Proficiency in Radiotelegraphy" shall be as follows, for each examination or re-examination:—

1. Extra First-class certificate ..	$1.00
2. First-class certificate	1.00
3. Second-class certificate	1.00
4. Third-class certificate	0.50
5. Experimental certificate	1.00
6. Amateur certificate	Nil.
7. Emergency certificates, any class ..	5.00

LONDON CONVENTION.

3. (i) The provisions of the International Radiotelegraph Convention of London, 1912, and of the regulations annexed thereto, shall be observed by all "coast stations" established in Canada, and by all "ship stations" on board any vessel registered in Canada.

(ii) *Penalty*.—Any person who instals or works any radiotelegraph apparatus at any of the above-mentioned stations in violation of this regulation, shall be liable on summary conviction to a fine not exceeding five hundred dollars ($500) and costs.

CONTROL OF STATIONS IN CASE OF EMERGENCY.

4. (i) *Coast and Land Stations*.—If, and whenever in the opinion of the Minister an emergency shall have arisen in which it is expedient for the public service that the Government shall have control over the transmission of messages by the apparatus of any coast or land station, it shall be lawful for the said Minister, by warrant under his hand, to direct and cause so much of the apparatus, as is within Canada or the territorial waters thereof, or any part of the apparatus, to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's Service and subject thereto for such ordinary services as to the said Minister may seem fit, and in that event, any person, authorised by the said Minister, may enter upon the stations, offices and works of any coast or land station or any of them and take possession thereof and use the same as aforesaid.

(ii) The Minister may, when he considers such an emergency as aforesaid to have arisen, instead of taking possession of such coast or land station, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the apparatus of such station, either wholly or partly and in such manner as he may direct, and such persons may enter upon the station premises accordingly, or the said Minister may direct the owner or his representative to submit to him or any person authorised by him all messages tendered for transmission or arriving by the apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said Minister may prescribe, and the owner or his representative shall obey and conform to all such directions.

(iii) The Minister may, when he considers such emergency as aforesaid to have arisen, close any coast or land station and cause the removal therefrom of the apparatus or any part thereof.

5. (i) *Ship Stations*.—If, and whenever, in the opinion of the Minister, an emergency shall have arisen in which it is expedient for the Public Service that the Government shall have control over the transmission of messages by the apparatus of a radiotelegraph station on board any Canadian registered vessel, it shall be lawful for the said Minister, by warrant under his hand, to direct and cause the apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's Service and, subject thereto, for such ordinary services as to the said Minister may seem fit, and in that event, any person authorised by the said Minister may enter upon any ship station and take possession thereof and use the same as aforesaid.

(ii) When the Minister considers such an emergency as aforesaid to have arisen, he may, instead of taking possession of such ship station, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the apparatus of such station, either wholly or partly, and in such manner as he may direct, and such persons may enter upon the station premises accordingly or the said Minister may direct the owner or his representative to submit to him or any person authorised by him all messages tendered for transmission or arriving by the apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said Minister may prescribe, and the owner or his representative shall obey and conform to all such directions.

NAVAL MINISTER'S REGULATIONS.

C ISSUED BY THE MINISTER OF THE NAVAL SERVICE IN ACCORDANCE WITH SECTION 11 OF THE RADIOTELEGRAPH ACT, CHAPTER 43, STATUTES 1913.

LICENSES.

1. *Application for License*.—Application for licenses to install and operate radiotelegraph equipments at any point in the Dominion of Canada or on board any ship registered therein, must be made to the Deputy Minister of the Department of the Naval Service, Ottawa, on the "Application for License" form, provided for that purpose, copies of which may be obtained on application to the above-mentioned Department.

2. *Classes of Licenses*.—The following classes of licenses will be issued:—

COAST STATIONS—
1. Limited Coast station.

LAND STATIONS—
2. Public Commercial station.
3. Private Commercial station.
4. Experimental station.
5. Amateur Experimental station.
6. Technical or Training School station.

SHIP STATIONS—
7. Ship station.

3. *Duration of Licenses*.—Licenses will be valid for one year, commencing on April 1st and expiring on March 31st of the following year. All licenses issued during the year automatically expire on March 31st, unless otherwise specified in the license.

4. *Limited Coast Licenses*.—Limited coast licenses will only be granted with respect to stations in localities not served by a regular Government coast station; such stations will be allowed to undertake a limited correspondence with ships at sea determined by the object of such correspondence. They must exchange public messages with such ship, coast and land stations as are designated in the license, but with no other stations whatsoever.

For ship to shore working they must be operated in accordance with the provisions of the International Radiotelegraph Convention, and they must employ such wavelengths below 600 metres or above 1,600 metres as are specified in the licence.

The watches to be maintained and the number and class of operators to be carried are to be as specified in the license, the regular form of which is annexed hereto. (Form No. W. 42.)

5. *Public Commercial Licenses*.—Public commercial licenses will be granted to land stations

open for public correspondence with certain other land stations designated in the license, and may use such wavelengths, within the following limits, as are specified therein :—

Below 200 metres.
" 450 "
Above 1,900 "

The watches to be maintained and the number and class of the operators to be carried are to be as specified in the license, the regular form of which is annexed hereto. (Form No. W. 18.)

"6. (i) *Private Commercial Licenses.*—Private commercial licenses will be granted to land stations to be operated in connection with the private correspondence of the licensee. Such stations will be limited to certain specific services which will be defined in the license. Such stations shall not exchange messages with stations other than those specified in the license, and except in the special case provided for in Section 2 of this Regulation, no tolls shall be levied or collected on account of any business transacted, or messages sent to or from the station. This class of station may use such wavelengths, within the limits prescribed, in Regulation No. 5, as are specified in the license. The watches to be maintained and the number and class of operators to be carried shall be as specified in the license, the regular form of which is annexed hereto. (Form No. 43.)

(ii) In the case of private commercial stations established at points not provided with any other means of rapid communication, such as telegraph or telephone, or in the case of interruption to such service, the Minister may prescribe that the licensed station must accept messages to and from the public, and communicate with such stations as may be designated. In this event, the licensee shall be entitled to collect a toll for the handling of such public correspondence, the amount of such toll to be as approved by the Board of Railway Commissioners and as specified in the licence.

(iii) The Minister at his discretion may authorise the licensed station to communicate with certain specified ship stations when such ship stations are within certain areas or localities to be specified in the license. Messages handled with such ships must be limited exclusively to the business of the licensee, no coast station charge shall be levied in respect of such message."

7. *Experimental Licenses.*—Experimental licenses will be granted to stations intended for experimental purposes and operated with a view to the advancement of the art of radiotelegraphy. Applicants for such licenses must state their technical attainments and the general lines on which they propose to pursue their investigations. It should be observed that the fact that the applicant desires to conduct experiments with his equipment does not justify or require a licence of this class, as most experiments can be conducted under the "Amateur Experimental License" by the use of an artificial aerial.

In addition to the provisions contained in the regular form of experimental license annexed hereto (Form No. W. 20), the following special regulations will apply to all experimental stations.

Special Regulations for Experimental Stations.

8. Applicants for an experimental license must state in their application what wavelength they desire to use; the following lengths being available—

Below 200 metres.
" 450 "
Above 1,900 "

In special cases and for short periods the Minister shall have power to permit the use of 300, 600 and 1,800 metres for the purpose of testing or demonstrating commercial apparatus, such permission to be given by letter under his hand.

9. The station is strictly limited to the use of such wavelength or wavelengths as are specified in the license.

10. When transmitting on wavelengths of 100 metres or less the station must be worked by a person holding an amateur experimental certificate of proficiency (see Regulation No. 97), and when transmitting on wavelengths greater than 100 metres it must, if it be within the range of any commercial or coast station, be worked by a person holding either a "First-class," "Second-class," or "Experimental" certificate of proficiency in radiotelegraphy. (See Regulations Nos. 93, 94 and 96.)

11. The power used, measured at the terminals of the transformer, must not exceed ½ kw.

In special cases, however, such as that of a commercial company desirous of testing and demonstrating apparatus, or stations so far removed from any commercial station or route of navigation as to preclude any possibility of interference, the Minister may at his discretion permit the use of greater powers than ½ kw.

12. The waves emitted must be as little damped as possible, and in no case shall the logarithmic decrement of a complete oscillation exceed two-tenths. The coupling between the primary and secondary of the oscillation transformer shall not be closer than that which gives a difference of five per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

13. A distinctive call signal will be allotted to each station, commencing with a figure, *e.g.*, 3 A A, etc., which signal shall be sent not less than three times at the termination of every transmission.

14. The regulations of the International Radiotelegraph Convention must, where applicable, be observed at the station.

15. The station, when operating, must listen for the signal "STP" which will indicate that an experimental station is interfering with commercial business.

The latter signal will only be made use of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STP" will, whenever possible, be preceded by the call signal allotted to the experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, experimental stations will absolutely cease to operate until the Government station gives the signal "Cancel STP."

16. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken. At all other times, such as when the spark is being tested or sending is being practised, the aerial must be disconnected.

17. When the licensed station is in the vicinity of a commercial station it should be connected with the local telephone exchange so

that instant communication may be established in case of interference.

18. *Amateur Experimental Licenses.*—Amateur experimental licenses will be granted to small stations used for instruction, experimental purposes, or amusement by persons relatively inexperienced in operating.

In addition to the provisions contained in the regular form of amateur experimental license annexed hereto (Form No. W. 44), the following special regulations will apply to all amateur experimental stations.

Special Regulations for Amateur Experimental Stations.

19. At amateur experimental stations the power used measured at the terminals of the transformer must not exceed ½ kw.

20. The wavelengths which may be used vary with the distance between the licensed station and any commercial coast or land station or a route of navigation as follows:—

For Transmission—

Class 1.—Stations located within 5 miles of a commercial coast or land station or a route of navigation, shall not use a transmitting wave-length greater than 50 metres;

Class 2.—Stations located more than 5 but less than 25 miles from a commercial coast or land station or a route of navigation, shall not use a transmitting wavelength greater than 100 metres;

Class 3.—Stations located more than 25 but less than 75 miles from a commercial coast or land station or route of navigation, shall not use a transmitting wavelength greater than 150 metres;

Class 4.—Stations located more than 75 miles from a commercial coast or land station or route of navigation, shall not use a transmitting wavelength greater than 200 metres.

21. In cases where transmitting apparatus is installed the natural wavelength of the aerial and the length of the emitted waves must be as specified in the license; in general this wavelength will be the maximum allowable under Regulation No. 20.

22. In cases where no transmitting apparatus is installed on the station, no limit is placed on the length of the aerial which may be used provided it is employed for the purpose of reception only.

23. The station must be worked by a person holding an amateur experimental certificate of proficiency (*see* Regulation No. 97).

24. The waves emitted must be as little damped as possible, and in no case shall the logarithmic decrement of a complete oscillation exceed two-tenths. The coupling between the primary and secondary of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

25. A distinctive call signal will be allotted to each station, commencing with a figure, *e.g.*, 3 A A, etc., which signal must be sent not less than three times at the termination of every transmission.

26. The regulations of the International Radiotelegraph Convention must, where applicable, be observed by the station.

27. The station must take every precaution to prevent interference with the working of other stations.

28. The station, when operating, must listen for the signal "STP" which will indicate that an amateur experimental station is interfering with commercial business.

29. The latter signal will only be made use of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STP" will, whenever possible, be preceded by the call signal allotted to the amateur experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, all amateur experimental stations will cease to operate until the Government station gives the signal "Cancel STP."

30. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken. At all other times, such as when the spark is being tested or sending is being practised, the aerial must be disconnected.

31. When the licensed station is in the vicinity of a commercial station it should be connected with the local telephone exchange so that instant communication may be established in case of interference.

32. *Technical and Training School Licenses.*—Technical and training school licenses will be granted to stations intended for educational purposes; they will be afforded every facility for the work they propose to undertake compatible with any special local conditions such as the existence of a commercial or coast station in their vicinity; in general they will be subject to the same conditions as amateur experimental and experimental stations.

33. *Ship Station Licenses.*—Ship station licenses will be granted to stations on British ships registered in Canada.

The regular form of the license is annexed hereto. (Form No. W. 19.)

Classification of Ship Stations.

Ship Stations will be classified as follows:—

34. *Class* 1.—All "sea-going" passenger vessels registered in Canada with an average speed of 15 knots or more, carrying 50 or more persons and plying between ports more than 200 miles apart; also all "sea-going" passenger vessels registered in Canada with an average speed of 13 knots or more, carrying 200 or more persons and plying between ports more than 500 miles apart.

35. *Class 2a.*—All "sea-going" passenger vessels registered in Canada affected by the provisions of Section 4 of the Radiotelegraph Act, which do not come under Class 1.

Class 2b.—All vessels registered in Canada plying on "coasting voyages" or on the "inland waters" of Canada which are affected by the provisions of Section 4 of the Radiotelegraph Act.

36. *Class* 3.—All vessels registered in Canada not affected by the provisions of Section 4 of the Radiotelegraph Act, but which have been voluntarily equipped with radiotelegraph apparatus.

The terms "sea-going," "coasting voyage," and "inland waters" are to be as defined in Section 72 of the Canada Shipping Act, Chapter 113, R.S. 1906.

Regular Equipment.

37. *Vessels in Class* 1.—The regular radiotelegraph equipment must have a minimum range of 100 nautical miles at all hours of the day and night with a similar equipment on a similar vessel and with all Canadian Government coast stations.

38. The normal wavelength of the emitted wave must be 600 metres; in addition the set must be capable of being operated on a wavelength of 300 metres, and means are to be provided whereby a quick change-over from one wavelength to the other may be effected.

39. In the case of small vessels on which it is materially impossible to use a transmitting wavelength of 600 metres, 300 metres may be employed; such ship stations, however, must be fitted with a receiver capable of tuning up to a 600 metre wavelength and the watches must be maintained on that wavelength.

40. The logarithmic decrement of a complete oscillation must not exceed two-tenths (0.2).

41. The power used by the transmitter, measured at the terminals of the generator of the station, must not, under normal circumstances, exceed 1 kw., except in the special case provided for in Article 35, paragraph 2, of the International Radiotelegraph Convention of London, 1912.

42. In the case of equipments using a power of more than 50 watts, an arrangement must be provided whereby several ranges, each less than the normal range, may be speedily obtained, the shortest range being, approximately, 15 nautical miles.

43. The use of "plain aerial" except in cases of distress or in installations using a power of less than 50 watts, is prohibited.

44. *Vessels in Class* 2.—Regulations No. 37 to No. 43, inclusive, shall apply to the equipments on vessels in Classes 2*a* and 2*b*.

45. *Vessels in Class* 3.—Regulations No. 38 to No. 43, inclusive, shall apply to equipments on vessels in Class 3.

Emergency Equipments.

46. *Class* 1.—Every vessel in Class 1 must carry an emergency source of power, instantly available, which shall be capable of operating the equipment for six hours, under normal conditions, with a minimum range of 80 nautical miles.

47. *Class* 2.—Vessels in Classes 2*a* and 2*b* must carry a similar source of power with the exception that the minimum normal range of the equipment is reduced to 50 nautical miles.

48. *Class* 3.—Vessels in Class 3 will not be required to carry emergency sets.

49. *Emergency Equipments Generally.*—(1) The emergency equipment in its entirety must in all cases be placed in the upper part of the ship, as high as practicably possible and in a position of the greatest safety.

(2) The emergency equipment may take the form of complete transmitter. Storage battery sets, of sufficient capacity to operate the regular radiotelegraph equipment of the vessel for the specified time, are, however, strongly recommended.

(3) A plain aerial transmitter may be installed as an emergency equipment, provided (subject to the provisions of Regulation No. 43) the use of the same is confined exclusively to distress calls.

(4) Regulations No. 46 to No. 49, inclusive, will become effective on and after December 1st, 1914.

50. *Spare Parts.*—Every ship station shall carry a reasonable number of spares of such parts of both the main and emergency radiotelegraph equipments as are subject to undue wear, deterioration, or liability to accident.

51. *Certificate of Inspection.*—The radiotelegraph installation on all British vessels registered in Canada will be subject to inspection by an officer of the Department of the Naval Service at least once a year, who, if the apparatus is found to comply with the terms of the Radiotelegraph Act and the regulations issued thereunder, shall issue to the vessel a "Radiotelegraph Inspection Certificate" certifying that the equipment has been duly inspected and that it complies with the provisions of the license issued therefor by the Minister of the Naval Service, such certificate to be posted in the radiotelegraph cabin.

52. *Time.*—Radiotelegraph stations on vessels plying on the West Coast shall observe Pacific time, and those on the Great Lakes and East Coast Eastern Standard time.

Watches.

53. *Vessels in Class* 1.—A constant watch must be maintained at the radiotelegraph stations on all vessels in Class 1 (Regulation No. 34) whilst they are en route, and two operators, holding first-class certificates, must be carried on such vessels.

54. *Vessels in Class* 2*a*.—A constant watch from 8 a.m. to 3 p.m. and a watch during the first ten minutes of every other hour of the day must be maintained at the radiotelegraph stations on all vessels in Class 2*a* (Regulation No. 35) whilst they are en route; the ten-minute watch may be maintained by an operator holding a "Second-class Certificate of Proficiency," or by a person holding a regular "Third-class Certificate."

55. *Vessels in Class* 2*b*.—Watches as hereinafter specified in Regulations No. 57 to No. 67, must be maintained at the radiotelegraph stations on all vessels in Class 2*b*, whilst they are en route.

56. (1) *Vessels in Class* 3.—No fixed watches need be maintained at radiotelegraph stations on vessels in Class 3 (Regulations No. 36) when plying on a coasting voyage or on the Great Lakes on the runs specified in Regulations 57 to 62.

(2) Vessels in Class 3 plying on transoceanic voyages, and carrying one operator, must keep watches as specified in Regulation 56*a*.

56*a*. Vessels carrying one operator, and plying on runs not covered by Sections 57 to 62, must whilst en route maintain watches as follows:—

Belt A.—East Atlantic and European.
From Long. 30° W. to Long. 30° E., including Baltic, Mediterranean and Black Seas.
0800 to 1000
1200 to 1400
1600 to 1800
2000 to 2200 G.M.T.

Belt B.—Indian Ocean.
From Long. 30° E. to Long. 90° E., including Red Sea and Persian Gulf.
0000 to 0200
1200 to 1400
1600 to 1800
2000 to 2200 G.M.T.

Belt C.—Australasian (Western).
From Long. 90° E. to Long. 160° E.
0000 to 0200
0400 to 0600
1200 to 1400
2000 to 2200

Belt D.—Australasian (Eastern).
From Long. 160° E. to Long. 140° W.
0000 to 0200
0400 to 0600
0800 to 1000
2000 to 2200 G.M.T.

Belt E.—East Pacific.
From Long. 140° W. to the Western Coast of America, thence southward along Long. 70° W.
0000 to 0200
0400 to 0600
1600 to 1800
2000 to 2200 G.M.T.

Belt F.—West Atlantic.
From Eastern Coast of America, and Long. 70° W. (South of Cape Horn) to Long. 30° W.
0000 to 0200
1200 to 1400
1600 to 1800
2000 to 2200 G.M.T.

PACIFIC COAST.

57. *Class 2b—Local Coasting Runs.*—Vessels in Class 2*b*, when plying on ferry or local runs between any ports in British Columbia south of Queen Charlotte Sound or between any ports in the above province north of that Sound and not steaming for more than 16 hours in any day, must, whilst en route, maintain watches during the following periods:—

7.30 a.m. to 8.00 a.m. and the last half-hour of every hour until 8.00 p.m.
9.30 p.m. to 10.00 p.m.
11.30 p.m. to 12.00 midnight.
3.30 a.m. to 4.00 a.m.
5.30 a.m. to 6.00 a.m.

In the case of vessels affected by Sub-section (*c*) of Section 4 of the Radiotelegraph Act (500 persons—ports more than 20 miles apart), the above watches need only be kept whilst the boats are en route between ports more than 20 miles apart.

58. Vessels in Class 2*b*, when plying on ferry or local runs between any ports in British Columbia south of Queen Charlotte Sound or between any ports in the above province north of that Sound and steaming for more than 16 hours in any one day, must, whilst en route, maintain watches as prescribed in Regulation No. 57, with the exception that a watch may be maintained from 1.30 a.m. to 2.00 a.m. instead of from 3.30 a.m. to 4.00 a.m., and no watch need be kept between the hours of 2.00 a.m. and 9.30 a.m.

59. *Class 2b—Coasting Vessels Plying North and South.*—Vessels in Class 2*b* plying on runs between ports in British Columbia south of Queen Charlotte Sound and ports in the same province north of that Sound, or *vice versa*, must, whilst en route, maintain watches during the following periods:—

7.30 a.m. to 8.00 a.m.
10.30 a.m. to 11.00 a.m.
1.30 p.m. to 2.00 p.m.
4.30 p.m. to 5.00 p.m.
7.30 p.m. to 8.00 p.m.
10.30 p.m. to 11.00 p.m.

If, during these periods, the vessel is in the immediate vicinity of any place mentioned in the lists given in Regulations 60 and 61, communication must be established with the coast station shown, or should the vessel reach such vicinity out of the above periods the ship station must call such coast station until communication is established or it becomes out of range.

60. *North Bound*:—

Station.	Locality.	
	Day Time. Between 7.30 a.m. and 11 p.m.	Night Time. Between 11 p.m. and 7.30 a.m.
Gonzales Hill	Trial Island	Trial Island
Point Grey	The First Narrows or Abeam Porlier Pass	The First Narrows or Abeam Porlier Pass.
Cape Lazo	Abeam	
"	Cape Mudge	Cape Mudge.
Alert Bay	Blinkensop Bay	
"	Abeam	Abeam.
"	Pine Island	Pine Island.
Triangle Island.. ..	"	"
"	Egg Island	Egg Island.
"	Before reaching Harold Point ..	Before reaching Harold Point.
"	Ivory Island..	Ivory Island.
Digby Island	Vancouver Rock	
"	Watson Rock	Watson Rock.
"	Abeam	Abeam.
"	Hodgson Island	
"	Pointers	Pointers.

61. ***South Bound*:—**

Station.	Locality.	
	Day Time. Between 7.30 a.m. and 11 p.m.	Night Time. Between 11 p.m. and 7.30 a.m.
Digby Island	Pointers	Pointers.
	Hodgson Island	
,, ...	Abeam	Abeam.
,, ...	,, ...	,,
,, ...	Lawyer Island	Lawyer Island.
Triangle Island ..	Vancouver Rock	Vancouver Rock.
,, ...	Ivory Island..	
,, ...	Harold Point	Harold Point.
,, ...	Egg Island	Egg Island.
,, ...	Pine Island	Pine Island.
Alert Bay	,, ...	,,
,, ...	Abeam	
,, ...	Blinkensop Bay	Blinkensop Bay.
Cape Lazo	Chatham Point	
,, ...	Abeam	Abeam.
Point Grey	Sisters	Sisters.
,, ...	Abeam	Abeam.
Gonzales Hill	Active Pass	Active Pass.

Great Lakes and East Coast.

62. *Class 2b—Vessels Plying on the Great Lakes and on Coasting Voyages on the East Coast.*—Vessels in Class 2*b* plying on voyages of more than 300 miles between terminal ports on the Great Lakes or East Coast must maintain watches whilst en route as follows:—

7.00 a.m. to 7.30 a.m.
10.00 a.m. to 10.30 a.m.
1.00 p.m. to 1.30 p.m.
4.00 p.m. to 4.30 p.m.
7.00 p.m. to 7.30 p.m.
10.00 p.m. to 10.30 p.m.

Communication must also be established with each coast station when abeam, irrespective of whether such position is reached during the above periods or not.

63. Vessels in Class 2*b*, plying on voyages of less than 300 miles but more than 50 miles between terminal ports and not steaming for more than 16 hours out of the 24, must maintain watches whilst en route as follows:—

8.00 a.m. to 8.30 a.m. and the first half-hour of every hour until 8.30 p.m.
10.00 p.m. to 10.30 p.m.
12.00 p.m. to 12.30 a.m.
4.00 a.m. to 4.30 a.m.
6.00 a.m. to 6.30 a.m.

64. Vessels in Class 2*b*, plying on voyages of less than 300 miles but more than 50 miles between ports and steaming for more than 16 hours in any one day, must, whilst en route, maintain watches as prescribed in Regulation No. 63, with the exception that 2.00 a.m. to 2.30 a.m. is substituted for 4.00 a.m. to 4.30 a.m., and no watch need be kept between the hours of 2.30 a.m. and 10.00 a.m.

66. Vessels in Class 2*b* plying on voyages of less than 50 miles between terminal ports and not steaming more than 10 hours out of the 24 must, whilst en route, maintain a constant watch.

67. Vessels in Class 2*b* plying on voyages of less than 50 miles between terminal ports and steaming for more than 10 hours in the 24 must, whilst en route, maintain watches as prescribed in Regulation No. 64.

Operation.

68. *Power Available.*—Power for the operation of the main equipment shall be available during the periods a watch is being maintained under Regulations No. 53 to No. 67.

69. *Control of Ship Stations.*—The operation of the radiotelegraph station on any vessel shall be under the supreme control of the master of such vessel.

70. *Censorship by the Master of a Vessel.*—The master of a vessel shall have the right to censor all messages addressed to or transmitted by a radiotelegraph station on board his vessel, but such master shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal), or make any use whatever of any message coming to his knowledge through the exercise of such censorship, nor shall the master or any operator divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal), or make any use whatever of any message (other than a message of distress) coming to his knowledge and not intended for the said station.

71. *Form W.* 40.—A copy of Form W. 40 must be posted in every radiotelegraph station; these forms may be obtained from the Deputy Minister of the Naval Service on request.

72. *Secrecy of Messages.*—No message shall be delivered, or its contents divulged, to any person except the addressee, his or her accredited agent, or such properly authorised persons as are essential for the forwarding of such message to its destination.

73. *Superfluous Signals.*—The transmission of superfluous signals by any ship or coast station is absolutely prohibited; trials and practices are forbidden except under such circumstances as to preclude the possibility of interference with other stations.

74. *Profane Language.*—No person shall transmit or make a signal containing profane words or language.

Operators.

75. *Operators.*—The apparatus of all coast,

land or ship stations must only be worked by persons holding regular Certificates of Proficiency in Radiotelegraphy, and who have subscribed to a Declaration of Secrecy, as prescribed in Section 6 of The Radiotelegraph Act.

76. *British Subjects.*—ALL OPERATORS on coast, ship or land stations must (subject to the provisions of Regulation No. 88) be British subjects, and the different classes of stations must be worked by operators holding Canadian "Certificates of Proficiency" (subject to the provisions of Section 77) not inferior to those hereinafter specified in Regulations No. 80 to 86, for the respective classes of stations.

77. *Ship Stations.*—The holders of Certificates of Proficiency in Radiotelegraphy issued in accordance with the provisions of the International Radiotelegraph Convention by His Majesty's Postmaster-General, the Administration of any British self-governing Dominion or Colony, or the Government of India, will (subject to the provisions of these regulations) be entitled to act as radiotelegraph operators on any Canadian vessels.

78. *Certificates of Proficiency.*—The following Certificates of Proficiency in Radiotelegraphy are issued by the Department.

Ship Stations—
- (1) First-class Certificate.
- (2) Second-class Certificate.
- (3) Third-class (Watcher's) Certificate.
- (4) Emergency Certificate.

Land and Coast Stations—
- (5) Extra First-class Certificate.
- (6) First-class Certificate.
- (7) Second-class Certificate.
- (8) Third-class (Watcher's) Certificate.
- (9) Emergency Certificate.
- (10) Experimental Certificate.
- (11) Amateur Experimental Certificate.

79. *Emergency Certificates.*—In case of emergency in which it is impossible for an operator to attend a regular examination, the Minister may hold an emergency examination and shall have power to issue emergency certificates of any class. Such certificates shall not be valid for more than six months.

Any person holding an emergency certificate of proficiency must promptly apply for permission to attend an examination as provided by Regulation 87, and when notified of the date and place of examination he is hereby further required to attend a regular examination for a certificate of proficiency within the requirements of Regulations 89 to 97 inclusive, and the said emergency certificate shall expire and cease to be of effect on the day on which the result of such regular examination is published.

OPERATORS TO BE CARRIED.

80. *Ships in Class 1.*—Ships in Class 1 must carry two operators holding First-class Certificates.

81. *Ships in Class 2a.*—Ships in Class 2a must carry two operators, one First-class and one Second-class, or one First-class and one Third-class.

82. *Ships in Class 2b.*—Ships in Class 2b must carry one First-class operator.

83. *Ships in Class 3.*—Ships in Class 3, if they undertake public correspondence, must carry one First-class operator or, if their service is limited exclusively to the ship's business, one Second-class operator.

84. *Coast Stations.*—(1) All public coast stations open for public correspondence and maintaining a constant watch must carry three operators, each of whom must hold a Canadian First-class Certificate of Proficiency. The Minister shall, however, have power in special cases to permit the employment of other persons on such stations for the purpose of maintaining the constant watch above mentioned, provided such persons are capable of transmitting and receiving in the Morse Code at a speed of twenty words a minute, as prescribed in Sub-sections (*a*) and (*b*) of Regulation No. 89 and provided the station is in charge of an operator holding a First-class Certificate of Proficiency.

(2) This regulation will become effective on and after the 1st of January, 1915.

85. All other coast stations shall carry such operators holding such certificates as are specified in the license issued for the station under Regulation No. 4.

86. *Land Stations.*—Land stations (commercial, experimental, etc.) shall carry such operators holding such certificates as are specified in the license issued for the station under Regulations Nos. 5, 6, 7, 18 or 32, according to the classification of the station.

EXAMINATION FOR RADIOTELEGRAPH CERTIFICATES OF PROFICIENCY.

87.—*Applications.*—Applications for permission to attend examinations for any certificate of proficiency must be made to the Deputy Minister of the Naval Service on the special form provided for that purpose (W. 13). The date and place of examination will be notified to the candidate as soon as possible after receipt of the application.

PERSONS ELIGIBLE TO ATTEND EXAMINATION.

88. (*a*) No person shall be permitted to attend examination for any class of certificate of proficiency in radiotelegraphy.

(i) who is not a natural born British subject;

(ii) who has at any time been of enemy nationality;

(iii) whose parents or either of them have at any time been of enemy nationality.

Provided, however, that any naturalised British subject who has not or whose parents or either of them have not at any time been of enemy nationality may be admitted to examination if his application be approved by the Minister of the Naval Service.

(*b*) Candidates for examination for first-class certificates of proficiency must be not less than eighteen years of age.

(*c*) For the purposes of this regulation a person shall be deemed to be of enemy nationality if he has at any time been a subject of a State with which Great Britain has been at war within the period of ten years immediately preceding the date of this regulation. (October 15th, 1919.)

SHIP STATIONS.

89. *First-class Certificate.*—Candidates for first-class certificates will be examined in the following subjects:—

(1) Transmission and reception at a speed of twenty words a minute;

(2) Adjustment, care and operation of apparatus;

(3) The regulations applicable to the exchange of radiotelegraph traffic.

The examination will consist of two sections "Practical" and "Written":—

"*Practical*" *Section.*

(*a*) To send on an ordinary radiotelegraph

key for five consecutive minutes at not less than the prescribed speed (viz., twenty words a minute, five letters being counted as one word); the accuracy of signalling, the correct formation of the letters, and the correctness of spacing will be taken into account.

(*b*) To receive and write legibly for not less than five consecutive minutes at the prescribed speed from signals received on a double headgear telephone receiver as ordinarily used for radiotelegraph reception.

(*c*) To connect up the apparatus with the help of a diagram of connections.

(*d*) To name the principal parts of the apparatus.

(*e*) To mention the most common faults which develop in the apparatus of the set in which he is being examined and the means usually taken to remedy them.

(*f*) To trace, locate, and remedy several such faults.

(*g*) To adjust the apparatus after it has been placed out of adjustment.

(*h*) To change the wavelength of the transmitter from 300 to 600 metres and *vice versa*.

(*i*) To reduce or increase the transmitting power.

"*Written*" *Section.*

(*j*) To complete a diagram of connections of the set in which the candidate is being examined.

(*k*) To answer seven technical questions on the equipment, including storage battery and emergency set, if any.

*(*l*) To answer nine questions on the methods of handling radiotelegraph messages and the regulations applicable to the exchange of radiotelegraph traffic and communications as set out in the latest edition of the British Postmaster-General's Handbook and the service regulations annexed to the International Radiotelegraph Convention in force; the questions will also include the counting, checking and computation of tolls on three test messages. The candidate will also be required to have a thorough knowledge of the use of the "C.P.R.," "Western Union," and "G.N.W." tariff books and the "Official List of Radiotelegraph Stations" issued by the International Telegraph Bureau. Given these books, he will be required to compute the charges on a test message from any ship *via* any Canadian coast station to any telegraph office in the world.

90. *Second-class Certificate.*—Candidates for second-class certificates must pass a satisfactory examination on all the subjects prescribed for the first class, with the exception that the minimum speed of transmission and reception is reduced to twelve words a minute. Holders of this certificate will only be allowed to operate stations on ships in Classes 2*a* and 3, as specified in Regulations Nos. 81 and 83.

91. *Third-class Certificate.* — Third-class (Watcher's) certificate will authorise the holder to work at one station only, the name and call signal of which will be designated in the certificate.

* The "Postmaster-General's Handbook for Wireless Telegraph Operators" and the "International Radiotelegraph Convention of London" referred to in this section may be obtained from the department of the Naval Service, Ottawa, for the sum of 20 cents and 10 cents each, respectively, post free.

The examination will be practical and *viva voce* and the candidate will be required:—

(1) To distinguish from other signals the call signal of the station designated in the certificate, when it is repeated several times, at the rate of ten words a minute;

(2) To distinguish from other signals the distress call "SOS" when it is repeated several times, at the rate of ten words a minute;

(3) To adjust the receiver for incoming signals on the wavelength normally used;

(4) To test the detector with a buzzer or other testing appliances and to adjust it for the efficient reception of signals on the normal wavelength.

COAST AND LAND STATIONS.

92. *Extra First-class Certificate.*—Candidates for Extra First-class Certificates, in addition to taking a thorough examination on the subjects set out in sections (*c*) to (*l*) of Regulation No. 89, will be required:—

"*Practical*" *Section.*

(*a*) To send and receive in the International Morse Code for five minutes at a speed of not less than twenty-five words a minute, under the conditions prescribed in sections (*a*) and (*b*) of Regulation No. 89;

(*b*) To trace, locate and remedy faults in standard radiotelegraph installations, of not less than five kilowatt power, including valve detector, gasoline engines, D.C. and induction motors and to adjust the same for efficient operation.

(*c*) The practical use of a wavemeter.

"*Written*" *Section.*

(*d*) To answer seven questions on the principles governing the working of radiotelegraph installations, internal combustion engines and dynamo electric machinery, as used in connection with radiotelegraph installations;

(*e*) To answer seven questions on the International Radiotelegraph Convention and regulations annexed thereto, the Regualtions issued by the Minister of the Naval Service and the procedure governing the obtaining of bearings from Direction Finding stations, the general organisation of a radiotelegraph service, including the procedure followed in connection with the transfer of business to and from land lines and the handling of radiotelegraph abstracts and accounts.

The holder of an extra first-class certificate will be authorised to operate on any Canadian coast, land or ship station.

93. *First-class Certificate.*—The examination for the first-class coast certificate will be similar in all respects to that for the first-class ship station certificate, with the exception that the candidate will be required to have a knowledge of the care and operation of gasoline engines.

94. *Second-class Certificate.*—The examination for the second-class coast certificate will be similar to that for the first class, with the exception that the minimum speed of transmission and reception is reduced to twelve words a minute.

95. *Third-class Certificate.*—The examination for the third-class coast certificate will be similar to that for the third-class ship certificate.

96. *Experimental Certificate.*—Candidates for an experimental certificate will be required:—

"*Practical*" *Section.*

(*a*) To send on an ordinary radiotelegraph key for five consecutive minutes at a speed of not less than twelve words a minute, five letters being counted as one word; the accuracy of signalling, the correct formation of the letters, and the correctness of spacing will be taken into account;

(*b*) To receive and write legibly for not less than five consecutive minutes at a speed of not less than twelve words a minute, five letters being counted as one word, from signals received on a double headgear telephone receiver as ordinarily used for radiotelegraphic reception, and to distinguish the signals "SOS," "STP," and his own call signal from among other signals, when sent at a speed of twenty words a minute;

(*c*) To reduce the transmitting power;

(*d*) To change the wavelength of the transmitter within the limits prescribed in the license issued for the station;

(*e*) To adjust the apparatus after it has been placed out of adjustment.

"*Written*" *Section.*

(*f*) To complete a diagram of connections of the set in which the candidate is being examined;

(*g*) To answer seven technical questions on the equipment, including storage battery and emergency set, if any;

*(*h*) To answer nine questions on the procedure governing the handling of radiotelegraph messages and the regulations applicable to the exchange of radiotelegraph traffic and communications, particularly as set out in part 5, sections 60 to 91 of the Postmaster-General's Handbook for Wireless Telegraph Operators, section 6, articles 20 to 35 of the regulations annexed to the International Radiotelegraph Convention, and the Minister's Regulations applicable to the operation of experimental stations.

*97. *Amateur Experimental Certificate.*—Candidates for an amateur certificate will be examined in the adjustment and operation of the apparatus they propose to operate and will be required to have a satisfactory knowledge of the departmental regulations governing the working of amateur experimental stations (Regulations No. 19 to No. 31), and those annexed to the International Radiotelegraph Convention of London, applicable to the working of stations generally, particularly section 6, articles 20 to 35, entitled "Transmission of Radiotelegrams."

The examination will be practical and *viva voce*, and the candidates will be required to send and receive in the International Morse Code at a speed of not less than five words a minute and to distinguish from other signals the signals "SOS," "STP," and the call signal of his station when repeated several times at a speed of ten words a minute.

EXAMINATIONS GENERALLY.

98. *Places at which examinations will be held.*—Examinations will generally be conducted at the Department of the Naval Service, Ottawa; special arrangements will, however, be made where circumstances permit for holding an examination at any radiotelegraph station or any technical school of telegraphy at which suitable apparatus is provided for the purpose.

99. The certificates of proficiency will indicate the system or systems of radiotelegraphy under which the candidate's examination was conducted.

100. *Failure to Pass.*—In case of failure a candidate will not ordinarily be re-examined until after the lapse of three months. An additional fee will be payable in respect of the further examination.

101. *Suspension of Certificate.*—Should it be proved to the satisfaction of the Minister that the holder of a "Certificate of Proficiency" has wilfully or negligently failed to comply with the provisions of the International Radiotelegraph Convention and Regulations, or of these regulations, or of any other regulations which may be issued from time to time for his guidance, the certificate may, at the discretion of the Minister, be suspended or cancelled.

INSPECTION OF STATIONS.

102. *Inspection.*—Any duly authorised officer of the department may, from time to time, and at all reasonable times, enter upon any coast, land or ship station, within the jurisdiction of Canada, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such station, also the working and user of such apparatus and telegraphic instruments, and all books and papers used in connection with the operation of such station. His authority will be in the form of a letter signed by the Deputy Minister of the Department of the Naval Service.

OPERATION OF SHIP STATIONS WITHIN THE TERRITORIAL WATERS OR HARBOURS OF CANADA.

103. *Ship Stations in Territorial Waters.*—*The Radiotelegraph Stations on board ships* (other than H.M. ships of war or Canadian Government vessels) *shall not be worked while such ships are within the Territorial Waters of Canada, unless specific permission is granted therefor* by the controlling Canadian coast stations for the locality, and then only provided such working does not interfere with the operation of any coast station established in Canada, and that the provisions of the Radiotelegraph Convention of London, 1912, and the Service Regulations annexed thereto are strictly observed.

104. *Ship Stations in Harbours.*—(*a*) The Radiotelegraph Stations on board ships (other than H.M. ships of war or Canadian Government vessels) shall not be worked whilst such ships are within a harbour of the Dominion of Canada, except as follows:—

(i) When direct communication between a ship in harbour and the shore is forbidden for quarantine or other special reasons, her radiotelegraph apparatus may be worked for one half hour after arrival and for one half hour before departure from such harbour.

(ii) For the purpose of making or answering signals of distress.

(*b*) For the proper enforcement of the above, ships in Canadian harbours shall, if so instructed by a Canadian Government

* The "Postmaster-General's Handbook for Wireless Telegraph Operators" and the "International Radiotelegraph Convention of London" referred to in this section may be obtained from the Department of the Naval Service, Ottawa, for the sum of 20 cents and 10 cents each, respectively, post free.

Radiotelegraph Inspector, or other properly authorised officer, completely disconnect the aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, in such a manner as to show they are properly disconnected.

105. *Penalty.*—Any person who violates any of the provisions of these regulations shall be liable on summary conviction to a penalty not exceeding fifty dollars and costs or three months' imprisonment.

EXTRACT FROM AIR REGULATIONS, 1919.

110. "No person shall instal or work a radiotelegraph or telephone apparatus in any aircraft primarily registered in Canada, except in accordance with the terms of a licence granted by the Minister of the Naval Service, and no person shall work any radiotelegraph or telephone apparatus on any aircraft, except in accordance with the provisions of the International Radiotelegraph Convention and the Service Regulations annexed thereto."

W. 42.

LIMITED COAST STATION LICENSE.

License No.

Date 19

DOMINION OF CANADA.

LICENSE TO USE RADIOTELEGRAPHY.

Issued in accordance with the provisions of the Radiotelegraph Act. Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named
resident of
hereinafter called the licensee, is hereby licensed to establish and operate a radiotelegraph coast station situated at
for the term of one year commencing on the first day of April, 19 and terminating on the thirty-first day of March, 19 , and to instal and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of ten dollars ($10), being the license fee for the privilege above named.

This license is subject to the Act and Regulations above referred to and to the following terms, conditions and restrictions:—

1. In this license the term "Minister" means the Minister or the Deputy Minister of the Naval Service for the time being.

2. (i) The licensee shall not establish, instal, or work any apparatus for radiotelegraphy, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii) The use of the licensed apparatus shall except in cases of distress, be limited to the exchange of messages with such stations, vessels or lines of vessels as are specified in the schedule.

(iii) No tolls, fees, or other consideration shall be received, levied, or collected by the licensee until the same have been approved of by the Board of Railway Commissioners for Canada, and in no case shall they exceed those fixed by the International Radiotelegraph Convention of London, 1912.

3. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Canada or the territorial waters abutting on the coasts of Canada (whether on shore or on any ship), by or for the purposes of the Minister or any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(*a*) With respect to all arrangements to be adopted for the purposes of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station;

(*b*) With respect to any alternation of messages which the Minister may think necessary;

(*c*) Generally with respect to avoiding interference between one radiotelegraph station and another.

4. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

5. (i) The coupling between the primary and secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

(ii) The logarithmic decrement per whole period, of the emitted waves, shall not exceed two-tenths, except when sending distress calls or messages relating to vessels in distress.

6. The licensee shall instal the apparatus at the station mentioned in the schedule, and the said station shall be placed in operation within months from the date of this license, and shall be kept in operation continuously during the hours specified in the schedule, until this licence shall expire.

7. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

8. The licensee shall, if so required in writing by the Minister, cease to use the licensed apparatus for such period (not exceeding hours in any one day), as may be specified by the Minister.

9. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

10. Subject to the provisions of this license, the licensee shall transmit and receive messages by means of the licensed apparatus to and from any other station or to and from any ship without regard to the particular system of radiotelegraphy installed at such other station

or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise.

11. (i) If and whenever any Department of the Government shall require the licensee, his servants or agents to transmit, by means of the licensed apparatus, any message on His Majesty's Service (including messages to and from ships of His Majesty's Royal Navy or Canadian Government vessels), such messages shall have priority over all other messages (except messages of distress) and the licensee, his servants and agents shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

12. The licensee shall, so far as possible, receive from all ships and light stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

13. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of form No. W. 40 issued by the Department of the Naval Service.

14. All messages transmitted by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and ultimate destination, and such further particulars as the Minister shall, from time to time, reasonably require to be shown, messages on His Majesty's Service being distinguished in such registers from other messages. The licensee shall preserve all used message forms written and printed, and transcripts of messages and all other papers for such period as is from time to time prescribed by the Regulations of the International Radiotelegraph Convention, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee, in   between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a public holiday.

15. The licensee shall make a monthly return to the Minister of all the messages handled by the licensed apparatus and in addition shall render to the Minister such accounts as the Minister shall direct in respect of all charges due or payable under the International Radiotelegraph Convention, in respect of ship-and-coast messages and shall pay to the Minister, at such times and in such manner as the Minister shall direct, all sums which shall be due from the licensee under such accounts.

16. All operators and other employees of he licensee at the said coast station shall be British subjects, and must be of such number and hold such Certificates of Proficiency as are specified in the schedule annexed hereto.

17. The licensee shall observe at the said station the provisions of the "Radiotelegraph Act" and those of the International Radiotelegraph Convention of London, 1912, and the detailed regulations from time to time made under each or either of them for carrying such provisions into effect.

18. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

19. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

20. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents of any of the terms or conditions herein contained, and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

21. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall, in his discretion, think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service and may be served by registered post letter to the
office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

1. Name of coast station ....
2. Location ....
3. Latitude and longitude ....
4. Call signal..................
5. Normal range :—
   Day ....
   Night ....
6. System of radiotelegraphy..................
7. Type of aerial..................
8. Characteristics of transmitter ....
9. Characteristics of receiver ....
10. Decrement per complete period..................
11. Wavelength (normal underlined)..................
12. Source of power..................

13. Maximum power taken by transmitter....
14. If A.C., number of cycles..............
15. Hours of service......................
16. Coast charge :—
    Per word.............................
    Minimum per message..................
17. Operators to be borne on station :—
    First class..........................
    Second class.........................
    Third class..........................
18. Total charge (ship and coast to apply on outward messages only) :—
    Per word.............................
    Minimum per message..................
19. Stations with which the licensed station may communicate.....................

....

Deputy Minister of the Naval Service.

Department of the Naval Service, Ottawa.

Dated this day of 19

W. 18.

F PUBLIC COMMERCIAL LICENSE.

19 License No.

DOMINION OF CANADA.

"LICENSE TO USE RADIOTELEGRAPHY."

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named
resident of
hereinafter called the licensee, is hereby licensed to establish and operate a Radiotelegraph land station situated at for the term of one year commencing on the first day of April and terminating on the thirty-first day of March , and to instal and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of Fifty Dollars ($50), being the license fee for the privilege above-named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions :—

1. In this license, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context repugnant to such construction, that is to say :—

The expression "marine signalling" means signalling by means of any system of radiotelegraphy between two or more ships, between ships and any coast station, or between two Government coast stations; and the term "Minister" means the Minister or the Deputy Minister of the Naval Service for the time being.

2. The licensee shall not establish, install or work any apparatus for radiotelegraphy, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to the exchange of messages with such coast and land stations as are specified in the schedule.

4. No tolls, fees, or other consideration shall be received, levied, or collected by the licensee until the same have been approved of by the Board of Railway Commissioners for Canada.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Canada by any Department of His Majesty's Government, or with the marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees :—

(*a*) With respect to all arrangements to be adopted for the purpose of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station;

(*b*) With respect to any alternation of messages which the Minister may think necessary; and

(*c*) Generally with respect to avoiding interference between one radiotelegraph station and another.

6. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

7. The licensee shall, if so required in writing by the Minister, cease to use the licensed apparatus for such period (not exceeding hours in any one day) as may be specified by the Minister.

8. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

9. (i) If the maximum power taken by the transmitter as mentioned in the schedule is less than 5 kw., then the coupling between the primary and secondary circuits of the transmitting oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits and the logarithmic decrement of the emitted waves per whole period, shall not exceed two-tenths.

(ii) In the case of stations using more than 5 kw. power the logarithmic decrement of the emitted waves per whole period shall be as specified by the Minister and as mentioned in the schedule.

10. (i) If and whenever any Department of the Government shall require the licensee, his servants or agents to transmit, by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other messages and the licensee, his servants and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message comming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his

accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W.40, issued by the Department of the Naval Service.

12. (i) All messages transmitted by means of the licensed apparatus shall be copied in full in register to be kept by the licensee for that purpose and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and ultimate destination and such further particulars as the Minister shall, from time to time, reasonably require to be shown, messages on His Majesty's Service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for such period as is, from time to time, prescribed by the Regulations of the International Radiotelegraph Convention, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee, in between the hours of 10 a.m. and 5 p.m. on every day, except Sunday, or a public holiday.

(ii) The licensee shall make a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose, and shall forward the same to the Minister at the end of each month.

13. The Minister or his authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

14. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

15. The licensee shall observe at the said station the provisions of the Radiotelegraph Act and the detailed regulations from time to time, made thereunder for carrying such provisions into effect; also such provisions of the International Radiotelegraph Convention of London, 1912, as are applicable to the operation of the station.

16. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this licence.

17. The licensee shall instal the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this license, and shall be kept in operation during the hours specified in the schedule until this license shall expire.

18. All operators and other employees of the licensee at the said station shall be British subjects, and must be of such number and the holders of such certificate of proficiency as are specified in the schedule annexed hereto.

19. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

20. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall, in his discretion, think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

21. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service and may be served by sending the same by registered post letter to the office of the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

1. Name of station....................
2. Location..............................
3. Call signal..........................
4. Normal range :—
   Day ....
   Night ....
5. System of radiotelegraphy.............
6. Type of aerial.........................
7. Characteristic of transmitter............
8. Characteristics of receiver..............
9. Decrement per complete oscillation......
10. Wavelengths ....
11. Source of power ....
12. Maximum taken by transmitter.........
13. If A.C., number of cycles..............
14. Hours of service.......................
15. Charges :—
    Per word..........................
    Minimum per message–...............
16. Operators to be borne on station :........
    First class ....
    Second class ....
    Third class ....
17. Station with which the licensed station must communicate.

....

Deputy Minister of the Naval Service.

Department of the Naval Service, Ottawa.

Dated this day of 19

W. 43.

PRIVATE COMMERCIAL LICENSE.

19 License No.

DOMINION OF CANADA.

"LICENSE TO USE RADIOTELEGRAPHY."

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named
resident of hereinafter called the licensee, is hereby licensed to establish and operate a radiotelegraph land station situated at for the term of one year commencing on the first day of April and terminating on the thirty-first day of March , and to instal and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of ten dollars ($10), being the licence feee for the privilege abovenamed.

This license is subject to the said Act and regulations, and to the following terms, conditions, and restrictions :—

1. In this license, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction that is to say :—

The expression "marine signalling" means signalling by means of any system of radiotelegraphy between two or more ships, between ships and any coast station, or between two Government coast stations ; and the term "Minister" means the Minister or the Deputy Minister of the Naval Service for the time being.

2. The licensee shall not establish, instal or work any apparatus for radiotelegraphy, except the apparatus hereinafter called "the licensed apparatus," specified in the said schedule hereto, nor shall wavelengths other than those mentioned therein be employed.

3. The working of the licensed station shall be limited to the exchange of messages with such coast and land stations as are specified in the schedule.

4. The station shall be worked solely for the transmission and reception of messages appertaining to the service or affairs of the licensee and no tolls, fees or other consideration shall be received, levied or collected by the licensee on account of any business or messages handled by the licensed apparatus.

5. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Canada by any Department of His Majesty's Government, or with marine signalling on the waters or territory of Canada or neighbouring waters or territory.

(ii) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees :—

(*a*) With respect to all arrangements to be adopted for the purpose of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station ;

(*b*) With respect to any alternation of messages which the Minister may think necessary ; and

(*c*) Generally with respect to avoiding interference between one radiotelegraph station and another.

6. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

7. The licensee shall, if so required in writing by the Minister, cease to use the licensed apparatus for such period (not exceeding hours in any one day) as may be specified by the Minister.

8. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

9. (i) If the maximum power taken by the transmitter as mentioned in the schedule is less than 5 kw., then the coupling between the primary and secondary circuits of the transmitting oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits and the logarithmic decrement of the emitted waves per whole period shall not exceed two-tenths.

(ii) In the case of stations using more than 5 kw. power the logarithmic decrement of the emitted waves per whole period shall be as specified by the Minister and as mentioned in the schedule.

10. (i) If and whenever any department of the Government shall require the licensee, his servants, or agents to transmit, by means of the licensed apparatus, any message on His Majesty's Service, such messages shall have priority over all other messages and the licensee, his servants, and agents, shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of the Naval Service.

12. (i) All messages transmitted by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and ultimate destination and such further particulars as the Minister shall, from time to time, reasonably require to be shown, messages on His Majesty's Service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and

printed, and transcripts of messages and all other papers for such period as is, from time to time, prescribed by the Regulations of the International Radiotelegraph Convention, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee, in between the hours of 10 a.m. and 5 p.m. on every day, except Sunday or a public holiday.

(ii) The licensee shall make a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose, and shall forward the same to the Minister at the end of each month.

13. The Minister or his authorised officers may from time to time, and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

14. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

15. The licensee shall observe at the said station the provisions of the Radiotelegraph Act and the detailed regulations from time to time made thereunder for carrying such provisions into effect; also such provisions of the International Radiotelegraph Convention of London, 1912, as are applicable to the operation of the station.

16. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

17. The licensee shall instal the apparatus at the station mentioned in the schedule and the said station shall be placed in operation within months from the date of this license, and shall be kept in operation during the hours specified in the schedule until this licence shall expire.

18. All operators and other employees of the licensee at the said station shall be British subjects and must be of such number and the holders of such certificate of proficiency as are specified in the schedule annexed hereto.

19. In case of any breach, non-observance, or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained, and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted and thereupon these presents and the said licenses, powers, and authorities, and each and every of them shall absolutely cease, determine and become void.

20. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain, and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

21. Any notice, request or consent (whether expressed in writing or not), to be given by the Minister, under these presents, may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service and may be served by sending the same by registered post letter to the office of the licensee and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

1. Name of station....................
2. Location ....
3. Call signal........................
4. Normal range :—
   Day ....
   Night..............................
5. System of radiotelegraphy ....
6. Type of aerial.....................
7. Characteristics of transmitter..........
8. Characteristics of receiver.............
9. Decrement per complete oscillation......
10. Wavelengths.......................
11. Source of power...................
12. Maximum taken by transmitter..........
13. If A.C., number of cycles..............
14. Hours of Service....................
15. Charges :—
    Per word ....
    Minimum per message ....
16. Operators to be borne on station :—
    First class........................
    Second class.......................
    Third class ....
17. Stations with which the licensed station must communicate ....

....

Deputy Minister of the Naval Service.

Department of the Naval Service, Ottawa.

Dated this day of 19

W. 20.

EXPERIMENTAL LICENSE.

19 License No.

DOMINION OF CANADA.

"LICENSE TO USE RADIOTELEGRAPH."

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate an experimental radiotelegraph station situated at for the term of one year commencing on the first day of April, 19 , and terminating on the thirty-first day of March, 19 , and to instal and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of five dollars ($5), being the license fee for the privilege above named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions :—

1. In this license, the term "Minister" means the Minister or the Deputy Minister of the Naval Service for the time being.

2. (i) The licensee shall not establish, instal or operate any apparatus for radiotelegraphy, except the apparatus hereinafter called the "licensed apparatus," specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii) The licensee shall work the licensed apparatus solely for the purpose of conducting experiments in radiotelegraphy and for no other purpose whatever.

3. (i) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Canada or the territorial waters abutting on the coasts of Canada (whether on shore or on any ship), by or for the purposes of the Minister or any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

(ii) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees :—

(*a*) With respect to all arrangements to be adopted for the purpose of securing syntonised apparatus or for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station ;

(*b*) Generally with respect to avoiding interference between one radiotelegraph station and another.

4. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

5. (i) The coupling between the primary and secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

(ii) The logarithmic decrement per whole period of the emitted waves shall not exceed two-tenths except when sending distress calls or messages relating to vessels in distress.

6. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of the Naval Service.

7. The Minister or his officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments respectively.

8. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

9. The licensee shall at all times indemnify the Minister against all actions, claims, and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

10. The licensed apparatus shall only be worked by a person, or persons, holding certificates as are specified in the schedule annexed hereto.

11. The licensed apparatus shall be operated in accordance with the provisions of the Radiotelegraph Act and the regulations issued thereunder by the Governor in Council or the Minister, and also in accordance with such provisions of the International Radiotelegraph Convention as are applicable to such operation.

12. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

13. (i) The Minister may at any time in his absolute discretion give notice in writing to determine these presents, and the license or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(ii) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period (not exceeding eight hours in any one day) as may be specified by the Minister.

14. In case of any breach, non-observance, or non-performance by or on the part of the licensee, his servants or agents of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted, and thereupon these presents, and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

15. Nothing in these presents contained shall prejudice or affect the right of the Minister from time to time, to establish, extend, maintain and work any system or systems, of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

16. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

1. Name of station......................
2. Location ....
3. Call signal...........................
4. Type of aerial.......................
5. Natural wavelength of aerial............
6. Transmitting wavelengths..............
7. Decrement per complete oscillation......
8. Source of power.....................
9. If A.C., number of cycles ....
10. Maximum power to be taken by transmitter ....
11. Hours during which station must not transmit ....
12. Characteristics of transmitter ....
13. Characteristics of receiver.............
14. The station must be worked by persons holding the following certificates—
    When transmitting on........metre wave..........
    When transmitting on........metre wave..........
15. Stations with which the licensed station may communicate.................

....
Deputy Minister of the Naval Service.
Department of the Naval Service, Ottawa.
Dated this day of 19

W 44.

AMATEUR EXPERIMENTAL LICENSE.

19 License No.

DOMINION OF CANADA.

"LICENSE TO USE RADIOTELEGRAPHY."

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations of the Minister made thereunder.

I The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate an experimental radiotelegraph station situated at for the term of one year commencing on the first day of April, 19 , and terminating on the thirty-first day of March, 19 , and to instal and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of one dollar ($1) being the license fee for the privilege above named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions :—

1. In this license, the term "Minister" means the Minister or the Deputy Minister of the Naval Service for the time being.

2. (i.) The licensee shall not establish, instal, or operate any apparatus for radiotelegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii.) The licensee shall work the licensed apparatus solely for the purpose of conducting experiments in radiotelegraphy and for no other purpose whatever.

3. (i.) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Canada or the territorial waters abutting on the coasts of Canada (whether on shore or on any ship), by or for the purposes of the Minister or any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

(ii.) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees :—

(*a*) With respect to all arrangements to be adopted for the purpose of securing syntonised apparatus or for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station ;

(*b*) Generally with respect to avoiding interference between one radiotelegraph station and another.

4. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

5. (i.) The coupling between the primary and secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

(ii.) The logarithmic decrement per whole period, of the emitted waves, shall not exceed two-tenths.

6. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of the Naval Service.

7. The Minister or his officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations and the working and user of such apparatus and telegraphic instruments respectively.

8. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed, and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

9. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

10. The licensed apparatus shall only be worked by a person, or persons, holding an Amateur Experimental Certificate of Proficiency in Radiotelegraphy as provided for in Regulation No. 97 of the Minister's Regulations.

11. The licensed apparatus shall be operated in accordance with the provisions of the Radiotelegraph Act and regulations issued thereunder by the Governor in Council or the Minister and in accordance with such provisions of the International Radiotelegraph Convention as are applicable to such operation.

12. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

13. (i.) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(ii.) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period (not exceeding eight hours in any one day) as may be specified by the Minister.

14. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then, and in any such case, the Minister may, by writing, revoke and determine these presents, and the licenses, powers and authorities hereinbefore granted, and thereupon these presents, and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

15. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

16. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

1. Name of station ....
2. Location ....
3. Call signal......................
4. Classification of station under Regulation No......................
5. Type of aerial ....
6. Natural wavelength of aerial ....
7. Transmitting wavelength ....
8. Decrement per complete oscillation......
9. Characteristics of transmitter ....
10. Characteristics of receiver..............
11. Source of power ....
12. Maximum to be taken by transmitter....
13. If A. C., number of cycles ....
14. Hours during which the station must not transmit ....
15. Stations with which the licensed station may communicate ....

....

Deputy Minister of the Naval Service.

Department of the Naval Service, Ottawa.

Dated this day of 19

W. 19.

SHIP LICENSE.

19 License No.

DOMINION OF CANADA.

"LICENCE TO USE RADIOTELEGRAPHY."

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statues 1913, and the Regulations of the Minister made thereunder.

Class Ship Station.

The herein named resident of hereinafter called the licensee, is hereby licensed to establish and operate a radiotelegraph station on board the vessel for the term of one year commencing on the first day of April, nineteen hundred and and terminating on the thirty-first day of March nineteen hundred and and to instal and operate at such stations the apparatus mentioned in the schedule hereto on payment of the sum of one dollar ($1), being the license fee for the privilege abovenamed.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions :—

1. In this license the term "Minister" shall mean the Minister or the Deputy Minister of the Naval Service for the time being.

2. (i.) The licensee shall not establish, instal or operate any apparatus for radiotelegraphy, except the apparatus hereinafter called the "licensed apparatus," specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii.) The ship station shall be of such class mentioned in Regulations Nos. 34, 35 or 36 of the Minister's Regulations, as is specified in the said schedule annexed hereto.

3. No tolls, fees or other consideration shall be received, levied or collected by the licensee until the same have been approved of by the Board of Railway Commissioners for Canada, and in no case shall they exceed the maximum fixed by the International Radiotelegraph Convention of London, 1912.

4. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister, from time to time, for the purpose of preventing interference with the working of any other radiotelegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelgraph station.

5. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

6. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

7. (i) The coupling between the primary and secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

(ii) The logarithmic decrement per whole period, of the emitted waves, shall not exceed two-tenths except when sending distress calls or messages relating to vessels in distress.

8. The licensee shall, so far as possible, receive from all ships and light stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

9. Subject to the provisions of this license, and in accordance with the regulations issued from time to time by the Minister, the licensee shall transmit and receive messages by means of the licensed apparatus to and from any coast station or to and from any other ship station without regard to the particular system of radiotelegraphy installed at such coast station or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise, provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

10. (i) If and whenever any Department of the Government shall require the licensee, his servants or agents to transmit,by means of the licensed apparatus any message on His Majesty's service (including messages to and from ships of His Majesty's Royal Navy or Canadian Government vessels), such messages shall have priority over all other messages (except messages of distress), and the licensee, his servants and agents shall, as soon as reasonably may be, transmit the same, and shall until transmission thereof, suspend transmission of all other messages.

(ii) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

11. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any messages coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus, nor shall he divulge to any person other than the addressee or his accredited agent the contents of any message coming to his knowledge intended for receipt by means of the licensed apparatus, and the licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of the Naval Service.

12. All messages transmitted by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its places of origin and ultimate destination and such further particulars as the Minister shall from time to time reasonably require to be shown, messages on His Majesty's Service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed, and transcripts of messages and all other papers for such period as is from time to time prescribed by the Regulations of the International Radiotelegraph Convention, and such registers and message papers shall be open to the inspection of the Minister or his officers thereto authorised at the office of the licensee, in between the hours of 10 a.m. and 5 p.m., on every day except Sunday or a public holiday.

13. The licensee shall prepare a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose, and shall forward the same to the Deputy Minister of the Naval Service at the end of each month.

14. The licensee shall render to the Minister such accounts as the Minister shall direct in respect of all charges due or payable under the Radiotelegraph Convention, 1912, in respect of messages exchanged between the ship station hereby licensed and coast stations or other ship stations, and shall pay to the Minister at such times and in such manner as the Minister shall direct all sums which shall be due from the licensee under such accounts.

15. The Minister or his duly authorised officers may, from time to time and at all reasonable times, enter upon the herein licensed ship station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

16. The licensee shall observe at the said station the provisions of the Radiotelegraph Act and International Radiotelegraph Convention of London, 1912, and the detailed regulations from time to time made under each or either of them for carrying such provisions into effect.

17. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

18. (i) The licensed apparatus at the said ship station shall be worked only by a person or persons holding a certificate or certificates issued by the Minister, the British Postmaster-General or the corresponding authorities of any self-governing British colony or the Government of India, and the licensee shall provide for the working of the station such operators as are required by the provisions of Regulations Nos. 80, 81, 82 or 83 of the Minister's Regulations according to the classification of the station as is specified in the schedule annexed hereto.

(ii) A certificate shall not be recognised as authorising the holder to work a ship station under the terms of this license unless it bears a statement that it is issued in accordance with the Radiotelegraph Convention, 1912.

19. The licensees shall carry on the ship on which the ship station is established under this license a properly certified copy of such license, and shall produce such copy for inspection if required so to do by the duly

authorised officials of the countries where the ship calls, and the following documents:—

Postmaster-General's Handbook for Wireless Telegraph Operators;
Official list of Radiotelegraph Stations;
Official list of Call Signals;
C.P.R., G.N.W. or Western Union Tariff Book;
Adequate supply of telegraph forms;
International Radiotelegraph Convention of London, 1912;

and also such other documents as may be prescribed by the Minister, for the purpose of enabling the licensee to communicate with coast and ship stations in accordance with the rules and regulations of the International Radiotelegraph Convention, 1912.

20. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted, and thereupon these presents, and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

21. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

22. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service and may be served by sending the same by registered letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

GENERAL.

1. Name of ship ....
2. Port of registry ....
3. Owner ....
4. Classification ....
5. Apparatus operated by...............
6. Call signal.............................
7. Nature of service......................
8. Watches to be maintained............
9. Operators to be borne on station—
   First class ....
   Second class ....
   Third class ....
10. Ship charge—
   Per word...........................
   Minimum per message ....

MAIN APPARATUS.

11. Normal range..........................
12. System of radiotelegraphy ....
13. Type of aerial..........................
14. Transmitting wavelength (normal underlined) ....
15. Source of power........................
16. Maximum taken by transmitter ....
17. Decrement per complete oscillation......
18. Characteristics of transmitter..........
19. Characteristics of receiver.............

EMERGENCY APPARATUS.

20. Normal range..........................
21. Wavelength ....
22. Source of power and capacity of same ....
23. Type of transmitter....................

....

Deputy Minister of the Naval Service.
Department of the Naval Service, Ottawa.
Dated this day of 19

W. 66.

Training School License. License No.
19 Call Signal

DOMINION OF CANADA.

"LICENSE TO USE RADIOTELEGRAPHY."

Issued in accordance with the provisions of the Radiotelegraph Act, Chapter 43, Statutes 1913, and the Regulations made thereunder.

KThe herein named
resident of
hereinafter called the licensee, is hereby licensed to establish and operate a radiotelegraph Training School situated at for the term of one year commencing on the first day of April, 19 , and terminating on the thirty-first day of March, 19 , and to instal and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of One Dollar ($1), being the license fee for the privilege above-named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this license the term "Minister" means the Minister or the Deputy Minister of the Naval Service for the time being.

2. (i.) The licensee shall not establish, instal or operate any apparatus for radiotelegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(ii.) The licensee shall work the licensed apparatus solely for the purpose of instruction in radiotelegraphy and for no other purpose whatever.

3. (i.) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Canada or the territorial waters abutting on the coasts of Canada (whether on shore or on any ship), by or for the purposes of the Minister or any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

(ii.) With a view to preventing such interferences as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(*a*) With respect to all arrangements to be adopted for the purpose of securing syntonised apparatus or for enabling the messages exchanged by means of the licensed apparatus to be distinguished

from those emanating from any other radiotelegraph station;

(*b*) Generally with respect to avoiding interference between one radiotelegraph station and another.

4. (i) The coupling between the primary and secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

(ii.) The logarithmic decrement per whole period, of the emitted waves, shall not exceed two-tenths.

5. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraph or telephone line.

6. The Minister or his officers, may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations and the working and user of such apparatus and telegraphic instruments respectively.

7. The licensed apparatus shall not, without the consent of the Minister be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

8. The licensed apparatus shall be operated in accordance with the provisions of the Radiotelegraph Act and the Regulations issued thereunder by the Governor in Council or the Minister and in accordance with such provisions of the International Radiotelegraph Convention as are applicable to such operation.

9. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the   and not intended for receipt by means of the licensed apparatus. No person shall operate or work the receiving apparatus at the licensed school who has not subscribed to, and filed with, the Minister of the Naval Department, a Declaration of Secrecy as prescribed in Section 6 of the Radiotelegraph Act and Radiotelegraph Regulation No. 72.

The licensee shall exhibit at the said station a copy of Form No. W. 40, issued by the Department of the Naval Service.

10. At least one of the instructors at the licensed school shall be the holder of a First-class Canadian Certificate of Proficiency in Radiotelegraphy. Other instructors, teaching in one or two subjects only, must have passed a successful examination in the subject or subjects, with which they propose to deal; the papers for this examination and the percentage of marks to be obtained will be as prescribed for the examination for a First-class Canadian Certificate of Proficiency in Radiotelegraphy.

11. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

12. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

13. (i) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(ii) The licensee shall, if so required by the Minister, cease to use the licensed apparatus for such period (not exceeding eight hours in any one day) as may be specified by the Minister.

14. In case of any breach, non-observance or non-performance by or on the part of the licensee, his servants or agents, of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted, and thereupon these presents and the said licenses, powers and authorities and each and every one of them shall absolutely cease, determine and become void.

15. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and user of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Canada, by means of radiotelegraphy, with or to any person or persons whomsoever, upon such terms as he shall, in his discretion, think fit.

16. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Naval Service, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Deputy Minister of the Naval Service, Ottawa.

SCHEDULE.

1. Name of station ....
2. Location ....
3. Call signal ....
4. Type of aerial ....
5. Natural wavelength of aerial ....
6. Transmitting wavelength ....
7. Decrement per complete oscillation ....
8. Characteristics of transmitter ....
9. Characteristics of receiver ....
10. Source of power ....
11. Maximum to be taken by transmitter ..
12. If A. C., number of cycles ....
13. Hours during which the station must not transmit ....
14. Stations with which the licensed station may communicate ....

....

Deputy Minister of the Naval Service.

Department of the Naval Service, Ottawa.
Dated this   day of   19

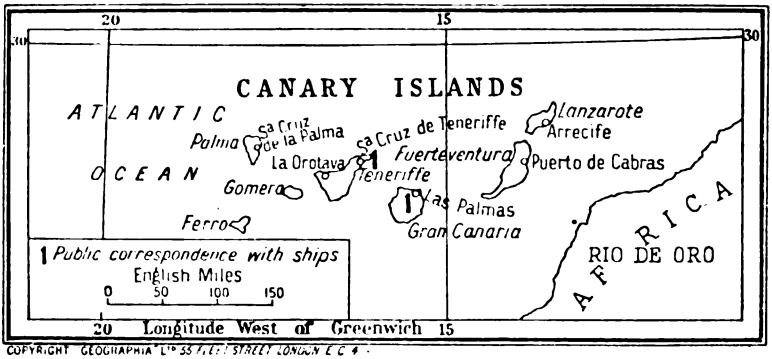
CONTINENTAL INDIA.

(See British India.)

CANARY ISLANDS

THE group of islands known under the above name consists of seven large and several small islands, whose combined area amounts to about 2,800 square miles and possesses a population of 360,000. It is commonly supposed that these islands constituted the Fortunate Islands of ancient history. They were forgotten, however, for several hundreds of years, but were re-discovered in 1334, when a French vessel was driven on to them by a storm.

They constitute at the present time a colony of Spain, and are administered by Spanish representatives.



CONTROL.

Wireless telegraphy in the islands is under the control of the Compañia Nacional de Telegrafia sin Hilos, which possesses two stations, one at Teneriffe and the other at Las Palmas.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
Mr. B. Walsh	Chief Engineer	Teneriffe.
Mr. W. Sparkes	Chief Engineer	Las Palmas.

There are five operators at each station.

ORGANISATION.

At the end of 1911 the Compañia Nacional de Telegrafia sin Hilos took over the wireless stations of Teneriffe and Las Palmas (at that time of 20 kw. power) from the old French company, and held trial programmes with the Poldhu station in England. As a result of this, each station was fitted with a Marconi 3 kw. set for ships. At the present time Teneriffe has three valve receivers and one crystal receiver for ships, with a low frequency amplifier. It is anticipated that the Spanish Government will shortly instal a direction-finding station, but at present the site has not yet been fixed. The Teneriffe station sends out Press Bulletins in English and Spanish daily at 0330, also a meteorological report in code is transmitted twice per day at 0905 and 1415 G.M.T. to Carabanchel, a military station in Madrid. Under the jurisdiction of the Canary Islands falls the military radio station at Cabo Juby, on the African mainland. This is a 3 kw. Telefunken set.

ADMINISTRATION.

No special Laws and Regulations exist under which wireless telegraphy and telephony are administered, their working being regulated in accordance with the International Rules.

CAPE VERDE ISLANDS

(See PORTUGAL.)

CEYLON

(See map on p. 160.)

THIS British Colony, lying S.E. of Hindustan (latitude 5° 53·5′ to 9° 50′ N.; longitude 79° 48′ to 81° 52′ E.), possesses a written history dating from 543 B.C., and the Portuguese were the first of European nations to fix a permanent settlement in the Island; this occurred in A.D. 1517. The Portuguese gave place to the Dutch in 1658, and the latter surrendered Ceylon to the British in 1796, possession being confirmed by treaty in 1802. The Island is administered by a Governor aided by an Executive Council of seven and a Legislative Council of twenty-one members.

CONTROL.

The Wireless Station is under the control of the Postmaster-General and Director of Telegraphs. The actual working is vested in the undermentioned officials :—

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. E. Harper, A.M.I.E.E., Mem. Inst. Radio Engrs.	Superintending Engineer	Colombo.
Mr. A. G. Tillekeratne ..	Superintendent of Traffic	Colombo.
Lieut. M. J. Golightly ..	Officer in Charge of the Wireless Station ..	Colombo.

The rest of the operating staff are members of the Postal Department. The station belongs to the Government. There are no Experimental Amateur or Ships' Stations licensed in Ceylon, and no Wireless Clubs or Societies exist in the Island. The granting of licenses to amateurs is under consideration.

ORGANISATION.

The erection of the first Wireless Station for Ceylon was sanctioned by the Ceylon Government in 1910. Finally a site in Colombo was adopted as the best available from an "all-round" standpoint for a single station. The contract for the station was given to the Marconi Wireless Telegraph Co. in 1911 and the station was brought into use in 1912. A station has been erected at Matara, and is under the control of the Admiralty. This station is not available for public correspondence. Arrangements for the transmission of Time Signals have not yet been completed, but it is hoped to include particulars in a subsequent edition. Local weather reports are available for ships on request and charged for in accordance with Article 45 of the International Radiotelegraph Convention of London, 1912. Weather reports for India from ships are accepted free.

A Flying Services Association has been formed in Ceylon with a view to assisting Government and Commercial Aviation generally. The machines will be fitted with wireless apparatus, and small installations will be erected at the Aerodrome, the sizes of which have not yet been finally decided upon. There are at present no direction finding stations. The experiments are being carried out at the Columbia station.

ADMINISTRATION.

Wireless Telegraphy in Ceylon and its territorial waters was originally legislated for under an Ordinance of 1903. In 1908 an Ordinance (No. 35) regulating Telegraphy in general was passed, which was afterwards extended to affect Wireless Telegraphy by an Amending Ordinance (No. 15), passed in 1914. This later Ordinance, however, specifically cancelled a provision, contained in that of 1908, which provided for the continuance in force of the original 1903 enactment. The latter has, therefore, now been completely abrogated, and Wireless Telegraphy in Ceylon is regulated (*a*) by such clauses

of the 1908 Ordinance as are applicable to Wireless Telegraphy; (*b*) by the Amending Ordinance (No. 15) of 1914; and (*c*) by the rules formulated under the provision of the latter Ordinance.

We print below the apposite sections of Ordinance 15 of 1914 and the rules based upon it.

A—Ordinance No. 15 of 1914 (August 18th)

B—Rules under this Ordinance.

ORDINANCE.

A Ordinance No. 15 of 1914 (modifying Ordinance No. 35 of 1908) and dated August 3rd, 1914, provides in its Clause 5 an amendment of Section 7 of the 1908 Ordinance. This prescribes the right of the Governor in Executive Council to "make rules, consistent with the Ordinance, for the conduct of all or any telegraphs established, maintained, or worked by the Government or by persons licensed under this Ordinance." Rules under this section may provide for all or any of the following, amongst other matters, that is to say:—

(*a*) The rates at which, and the other conditions and restrictions subject to which messages shall be transmitted.

(*b*) The precautions to be taken for preventing the improper interception or disclosure of messages.

(*c*) The period for which, and the conditions subject to which, telegrams and other documents belonging to, or being in the custody of, telegraph officers shall be preserved; and

d) The fees to be charged for searching for telegrams and other documents in the custody of any telegraph officer.

(*e*) For prescribing the form and the manner in which applications for licenses under this Ordinance are to be made.

(*f*) For prescribing fees payable on the grant of any license.

(*g*) For regulating the manner in which an apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of Ceylon, shall be worked so as to prevent interference with naval signalling, or the working of any wireless telegraph or telephone station lawfully established, installed, or worked in Ceylon or the waters thereof, and so as not to interrupt or interfere with the transmission of any messages between wireless telegraph or telephone stations established as aforesaid on land and wireless telegraph or telephone stations established on ships at sea.

(*h*) For prohibiting, except with the special or general permission of the Postmaster-General of Ceylon, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, while such ship is in any of the harbours of Ceylon.

(*i*) For prohibiting or regulating, in case at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of Ceylon, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may deem fit to make from time to time, either in all cases, or in such cases as may be deemed desirable.

Moreover, Clause 6 of Ordinance No. 15 of 1914 adds to Clause 7 of the 1908 Ordinance a new sub-section lettered (2) A, which runs as follows:—

Provided that no regulations made in respect of the matters described in paragraphs (*g*), (*h*), and (*i*) or sub-section (2) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

* * * *

RULES.

B The current rules, under which the wireless telegraphy is at present administered, were issued on December 3rd, 1914. They were based on Ordinance 15 of 1914 (see above) and run as follows:—

December 3rd, 1914.

1. Any person desirous of obtaining a license for the establishment of a wireless telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in the Colony, or on board any British ship registered in the Colony, must apply in writing to the Colonial Secretary. Such application must contain full particulars—

(*a*) Of the place or ship in respect of which a licence is sought;

(*b*) Of the nature of the apparatus which it is desired and proposed to instal and work; and

(*c*) Of the purposes for which the installation is intended to be utilised.

2. The following shall be the fees payable on the grant of licenses:

	Rs.
(*a*) For a license for a land station	5
(*b*) For a license for a ship station	5
(*c*) For an experimental license ..	Free

3. All apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Colony, shall be worked in such a way as not to interfere with:

(*a*) Naval signalling; or

(*b*) The working of any wireless telegraph station lawfully established, installed, or worked in the Colony or in waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station, whether on shore or on any ship.

5. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour, port, or bay of the Colony, except with the special or general permission of the Postmaster-General.

6. (i) If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, and notice to that effect is published by the Postmaster-General, after the publication of such notice and until further notice the use of wireless telegraphy on board merchant ships, whether British or foreign, whilst in the waters of the Colony, shall be subject to such rules as may be made by the Governor, and such rules may prohibit or regulate such use in all cases, or in such cases as may be deemed desirable.

(ii) Such notice as aforesaid shall be published in the *Ceylon Government Gazette*, and in such other manner, if any, as to the Postmaster-General may seem fit.

7. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

8. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

9. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

CHILE

THE narrow strip of territory constituting the Republic of Chile lies between that remarkable range of mountains known as the Andes, and the Pacific Ocean. The country is divided into 23 provinces, and the total estimated population in 1915 was about 3½ millions.

CONTROL.

Wireless Telegraphy in Chile is a State monopoly under the management of the Naval Department.

All Chilian wireless stations, both ship and land, are controlled by the Admiralty, and the Wireless Section of the Navy forms part of the general organisation administering naval affairs.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

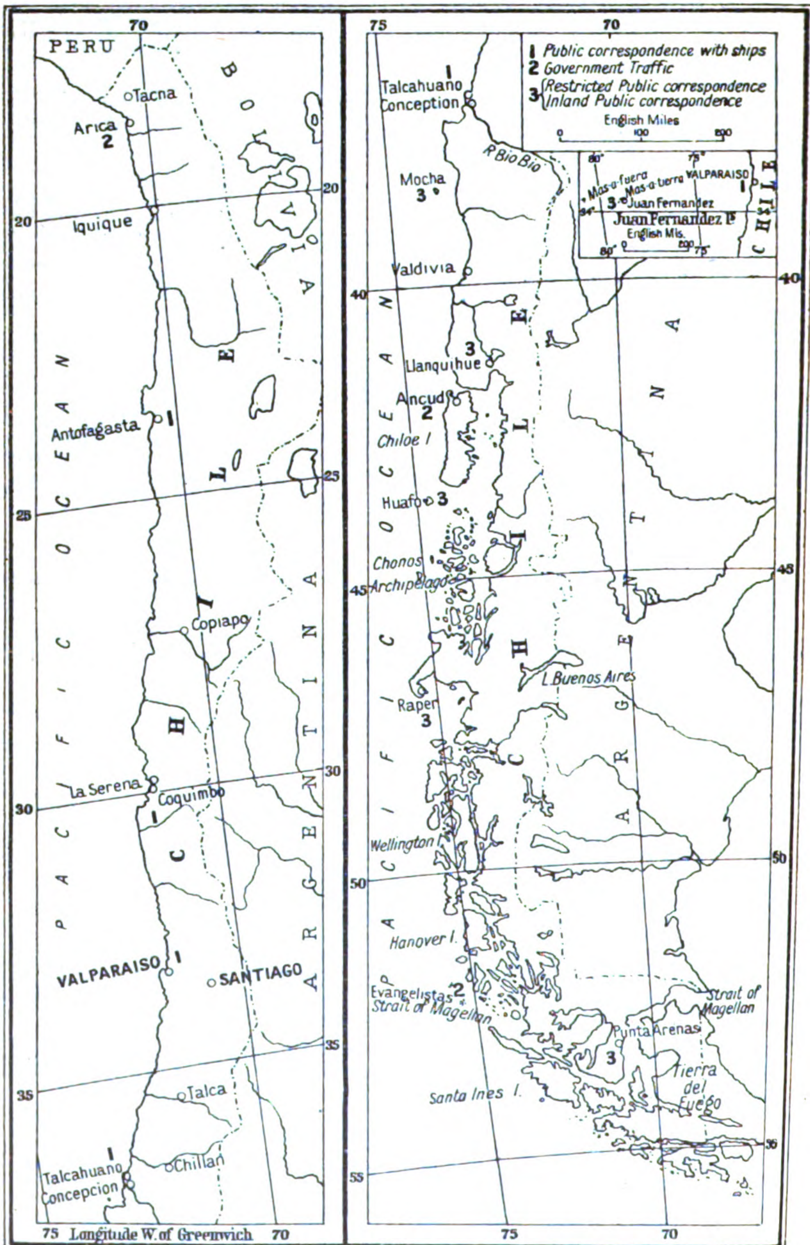
Official.	*Title.*	*Address.*
Rear-Admiral Don Miguel Aguirro	Chief of the General Maritime Office	Direction del Territorio Maritime Valparaiso
Lieut.-Com. Don A. Brito	Head of the Wireless Section ..	Do. Do. Do.
1st Lieut. A. Romero ..	Assistant do.	Do. Do. Do.

ORGANISATION.

The first practical demonstration of wireless telegraphic communication was given in 1904, when the Marconi Company conducted a series of successful experiments between the Chilean Navy Cruisers "Esmeralda" and "Errazuriz," the apparatus utilised being coil and coherer sets.

At the present time the number of stations in operation total 56; these include 16 land stations varying in power from ½ kw. to 100 kw. The stations fall under the following classification:—

Ship Stations	— Naval	25
,, ,,	— Mercantile	15
Land Stations	— Open to public service ..	11
,, ,,	— Control	1
,, ,,	— Experimental	2
,, ,,	— For aviation services ..	1
,, ,,	— Amateur	1


PERU
Tacna
Arica 2
BOLIVIA
Iquique
Antofagasta 1
Copiapo
La Serena
Coquimbo 1
VALPARAISO 1
SANTIAGO
Talca
Chillan
Talcahuano 1
Concepcion
PACIFIC OCEAN
CHILE
ARGENTINA
75 Longitude W. of Greenwich 70
1 Public correspondence with ships
2 Government Traffic
3 Restricted Public correspondence
Inland Public correspondence
English Miles
0 100 200
Mas-a-fuera
Mas-a-tierra
VALPARAISO 1
3 Juan Fernandez
Juan Fernandez Is.
English Mls.
CHILE
Talcahuano 1
Conception
R Bio Bio
Mocha 3
Valdivia
Llanquihue 3
Ancud 2
Chiloe I
Huafo 3
Chonos Archipelago
L. Buenos Aires
Raper 3
Wellington I.
Hanover I.
Evangelistas 2
Strait of Magellan
Punta Arenas
3
Strait of Magellan
Tierra del Fuego
Santa Ines I.

ADMINISTRATION.

Below will be found the Law and Regulations governing the use of wireless in Chile.

A—Law governing wireless service in Chile.

B—Regulations for the Wireless Service.
(Licenses and Categories, Wireless Sets, Staff, Service and Documentation, Inspections, Belligerency and Neutrality of the Wireless Stations, License for Ship Wireless Station, Wavelength, License for Ship Wireless Operator.)

C—Regulations for Radio Communication.
(General Dispositions, Acceptance, Taxation and Payment of Radiotelegrams, Transmission and Reception of Radiotelegrams, School for Mercantile Radiotelegraph Operators, Admission of Students, Examination of Students, Examination for Second and First-class Operators, Repetition Courses and Requalifying for Titles, Syllabus of Oral and Written Examinations.)

D—Regulations for Private, Amateur, and Practical Radiotelegraph Stations.

PROJECT OF LAW GOVERNING THE WIRELESS SERVICE IN THE CHILEAN REPUBLIC.

SECTION I.

ART. 1.—Wireless stations destined to transmit and receive wireless signals to or from other wireless stations in Chile or in any other foreign country, can only be installed and worked by the State.

Nevertheless, the State may permit the installation and working of private wireless stations destined exclusively to experimental work or for purposes of instruction, but under the condition that the power of such stations shall not exceed 1/12 h.p. All wireless stations installed for experimental or educational purposes shall be submitted to the inspection and control established in the respective regulation.

ART. 2.—All persons that instal or attempt to instal clandestine wireless stations of any kind shall be liable to punishment according to the regulations of the service and the laws of the country.

The State will confiscate all the material employed in these clandestine stations.

ART. 3.—(*a*) The State will dispose the installation of all the wireless stations in the country electing the sites according to plans consulting all military, naval and commercial necessities of the country.

(*b*) In those isolated regions of the country where private persons solicit wireless communication and there exists manifest convenience in the establishment of such communications, wireless stations may be installed, but under the condition that the land required shall be ceded to the State by those interested also the total cost or that part of the cost decided upon by the Government, shall be borne by the persons or parties interested in the said communication.

At the termination of the construction of such stations the same shall pass over wholly to the State together with the land occupied.

ART. 4.—The wireless installations shall be as uniform as possible, and of a national type that shall satisfy the wireless service of the country and the different parts shall, as far as possible, be made in the country.

ART. 5.—All the wireless stations destined to transmit or receive wireless communications of any kind shall be under the charge of the Ministry of Marine, and the stations shall be worked by personnel of the Navy with exception of the Army wireless stations which will be under the charge of the Ministry of War.

ART. 6.—The Minister of Marine will designate the wireless stations that may attend public service of wireless communication.

These stations shall be directly connected to the State land telegraphs, which will serve to connect the wireless stations with the general public.

The tariffs shall be collected under the charge of the Minister for Home Affairs, and the said Ministry shall maintain all relations and communications that the wireless service may cause with other foreign administrations, wireless telegraph companies, telegraph or cable companies.

ART. 7.—(*a*) Six months after this law is passed no ship will be allowed to enter or leave any of the ports of the Chilean Republic that carries 50 or more persons on board (including the crew), unless the ship is installed with wireless telegraph apparatus.

The wireless apparatus must be in working order and be capable of transmitting and receiving messages at a distance not less than 200 miles during the daytime.

(*b*) In certain accidental cases expressly determined by the respective regulations, ships may be allowed to enter or leave Chilean ports, although they may be carrying 50 or more persons on board, and are not installed with wireless telegraph apparatus.

(*c*) The respective regulation will fix the number of operators, capable of working the wireless installation that all merchant ships must carry according to their class, which class will be determined by the same regulation.

(*d*) Any infraction or attempt at infraction of this article will be fined the sum of from one to five thousand Chilean gold dollars.

ART. 8.—(*a*) The wireless apparatus installed on board Chilean merchant ships will be subjected to the conditions that the respective regulations may fix.

(*b*) All wireless operators on board Chilean merchant ships must be of Chilean nationality.

(*c*) The Government will establish annexed to the Naval wireless school, the necessary courses of instruction to form operators destined to serve in the National Merchant Marine.

The cost of these courses will be paid for by the companies or persons concerned, in the form to be indicated by the respective regulation.

ART. 9.—In the annual budget funds will be consulted to maintain and increase the State Wireless Telegraph Service.

SECTION II.
GENERAL REGULATIONS OF THE WIRELESS SERVICE.

Chapter I.

Licenses and Categories.

BY Art. 1.—Every sailing or mechanically propelled vessel having 50 persons or more on board, including the crew, and not being permanently anchored, must possess an efficient wireless set capable of communicating up to 200 miles during the day.

Art. 2.—(*a*) Before carrying out any installation whatever, the company or shipowners should apply in writing to the Maritime Territory Section of the Navy, for a numbered copy of the special formulary of licenses, in order to fill in the particulars of the wireless set, and return it duly completed to the said authorities.

(*b*) Subject to the corresponding report by the wireless inspector, this document shall be submitted through the usual channel to the supreme Government for its approval.

(*c*) Only from the time the license is approved by the Government will the shipowners be allowed to use the wireless set.

(*d*) The licenses to be made out for a period not exceeding five years.

Art. 3.—It is prohibited to use a wireless set without a license, or with one whose time has expired, unless the companies, shipowners or proprietors, have made an application for its renewal, and this is granted in accordance with Art. 2.

Art. 4.—Such shipowners, companies or proprietors of wireless sets, who should be in need of a duplicate of the license in order to replace the original one lost or destroyed, must lay before the Maritime Territory Section evidence of the circumstances which caused such loss or destruction. That duplicate will be given by this authority, with the same original number and with the word "duplicate" written in red letters, and diagonally across the first page.

Art. 5.—The following vessels are excepted from the obligation set up in Art. 1 :—

(*a*) Those national ships registered with less than 100 tons, which do a coasting trade exclusively within inhabited canals or sheltered and safe bays.

(*b*) Those national ships of small cargo which carry ordinarily less than 50 persons on board, are incidentally used for pleasure excursions or others of a sporting character, and consequently carry a greater number of persons. These excursions should not be in excess of four in 30 consecutive days, nor be made outside a radius of 30 nautical miles from the starting point, nor last longer than 24 hours each time.

Art. 6.—Such vessels as are included in Clauses (*a*) and (*b*) of the previous article, shall apply in writing to the Maritime Territory Section of the Navy for the corresponding license, enclosing a maritime authority certificate of the registered port, attesting the right of exception.

The Maritime Territory Section shall make out the license for periods to be renewed on the 1st January of each year, on the application of the person concerned.

Art. 7.—The wireless station to be classified in three categories, namely :—

(*a*) First category.—To this category belongs those ships that have a permanent service, and that carry more than 50 persons on board and that develop an average speed of 12 miles an hour, and under these conditions run a single trip not exceeding 500 miles.

(*b*) Second category.—To this category belongs those ships that have a service of limited duration, and that carrying more than 50 persons on board, develop an average speed of less than 12 miles, and under these conditions do not run more than 500 miles per single trip.

(*c*) Third category.—To this category belongs those ships that have no regular service, and that are not included in the first and second categories.

(*d*) The categories will be assigned in the licenses for installing wireless sets.

CHAPTER II.

Concerning the Wireless Sets.

Art. 8.—The type or system of the wireless set is left to the option of the company, shipowners or proprietors, an express condition being that the circuits composing it should be "syntonised," *i.e.*, have the same period of vibration.

Art. 9.—(*a*) The power of the wireless set will be sufficient to obtain a distance of 200 nautical miles during the day, and is at all times to be in a state for use.

(*b*) While wireless communications are being made the minimum power consistent with the distance will be employed.

(*c*) The companies, shipowners or proprietors will, however, be able to dispose of a higher power than the one set up in Clause (*a*) of this article ; subject to an application being made for it when filling in the particulars of the license.

(*d*) The wireless set will be tried at full power once a week to verify its efficiency.

Art. 10.—(*a*) The normal wavelength is 600 metres and every station must be able to use this wavelength as well as that of 300 metres.

(*b*) Wireless communications between vessels and with land wireless stations will always be made with 600 metres wavelength ; but such characteristic may be, by mutual agreement, altered in cases of difficulty in the transmission, the normal wavelength to be resumed at the end of the transmission of the message.

(*c*) The waves emitted shall be very pure and as deadened as possible.

Art. 11.—It is prohibited to use the simple vertical radiator, except in cases of signals for help ; the aerial of this type, implying that which allows for the direct transmission of waves by means of sparks.

Art. 12.—The wireless set must be capable of transmitting and receiving messages at a speed of no less than 20 words per minute, calculated at the rate of five words per minute.

Art. 13.—(*a*) Every wireless station shall be provided with a quantity of spare-parts and tools necessary for repairs and to rapidly replace those elements which may deteriorate by accidents.

(*b*) A pair of complete telephone receivers to be always kept in reserve.

(*c*) Similarly, a voltmeter, a hydrometer, electrolite, and distilled water, for the working and preservation of the battery will also be available.

Art. 14.—(*a*) Between the wireless station and the bridge will be established an efficient communication, for which object a telephone, or speaking-tube, may answer the purpose. Such communication will commence and end at either of the above-mentioned points, or in the chart room, if this is near the bridge.

(*b*) Should the wireless station be accessible from the bridge the orders may be given by

word of mouth, without having a special communication installed.

(*c*) Verbal transmission of messages by means of a third person is prohibited.

ART. 15.—Any alteration in the apparatus involving a change in the characteristics of the wireless set is subject to the authorisation of the Maritime Territory Direction.

ART. 16.—(*a*) Where the ship to which the wireless set belongs goes under repairs for more than three months, the license will be forwarded to the Maritime Territory Direction with a view to writing on it the corresponding annotations.

(*b*) In case of definitive dismantlement of the ship, or of it being placed on a different service not requiring it to possess a wireless set, the license will likewise be sent for its cancellation to the Maritime Territory Direction.

ART. 17.—(*a*) Every ship will have an emergency power independent of the principal electric plant, capable of transmitting wireless messages for four consecutive hours at least, and sufficiently protected against accidents.

(*b*) The transmitting apparatus will be continuously in a state of working by means of the emergency power at only two minutes' notice.

(*c*) Before sailing, and daily while at sea, the wireless set will be tried utilising the emergency power, and its results will be noted in the wireless log.

(*d*) Occasionally, from the land stations, the ships at sea will be called upon to send messages with the emergency power, in order to ascertain their efficient condition.

CHAPTER III.

STAFF, SERVICE AND DOCUMENTATION.

ART. 18.—(*a*) For the working of wireless sets on board the Chilean mercantile ships, the operator is required to be in possession of the title of wireless telegraphist, conferred by the Maritime Territory Direction of the Navy.

(*b*) Only Chilean subjects, or naturalised foreigners, in accordance with the Republican Laws, will be able to obtain those titles.

(*c*) Candidates for the position as wireless operators must pass the examinations set up in Section IV of the present General Rules, and comply with the requirements therein laid down.

(*d*) Every wireless operator is bound by oath to maintain strict secrecy in the correspondence, whatever the nature of this may be.

ART. 19.—The titles are of two classes: First and Second:—

(*a*) First Class.—Titles of this class will be conferred upon those operators who, having passed satisfactorily the examinations in Section IV, can send and receive wireless messages at a speed of not less than 20 words a minute (Chapter II, Art. 12).

(*b*) Second Class.—Titles of this class will be conferred upon those operators who, having passed satisfactorily the examinations quoted in the previous clause, can send and receive wireless messages at a speed of between 12 and 19 words a minute.

ART. 20.—The appointment of wireless operators in the mercantile vessels will be as expressed below:—

(*a*) First category wireless station.—This will have at least two first class wireless operators.

(*b*) Second category wireless station.—This will have at least one first class operator and one second class.

(*c*) Third category wireless station.—This will have at least one first class operator and one second class.

ART. 21.—The service of watchmen will be run in accordance with the category to which the wireless stations belong (Art. 7, Chapter I), as follows:—

(1) First category wireless stations.

(*a*) The watch will be kept permanently, that is to say, the wireless operator will continuously have the receivers on, or off, but within the premises of the wireless station, when this be fitted with special instruments of communication, such as bells, etc.

(*b*) The wireless operator will communicate every half-an-hour to the official on duty on the bridge any changes, to show that he has not abandoned his post.

(*c*) He will make notes on the station log every quarter-of-an-hour, making sure that such notes consist of characteristics of other stations and of other words intercepted.

(2) Second category wireless stations.—The watch will consist of at least 10 hours daily and of 10 minutes at the beginning of each remaining hour; the same obligations as those laid down in the previous clause applying to the operators of these stations while they are on duty.

(3) Third category wireless stations.—The watch will be eventual, as when entering or leaving the port, in places of much maritime traffic, etc., leaving the organisation of the service to the arbitration of the ship's captain.

ART. 22.—(*a*) Should an operator fail to comply with the present regulations, the information to that effect being given either by the ship's captain or through the controlling wireless stations, the Maritime Territory Direction of the Navy will have the option of suspending the culprit for a given time, or definitely cancelling his title, according to the gravity of the omission.

(*b*) Where such omissions are not the fault of the operator himself, but through reasons over which he has no control, or through express orders of the companies, shipowners or proprietors, the Maritime Territory Direction of the Navy, will make the necessary inquiries and the consequent fine will be made against him.

ART. 23.—The wireless service on board a merchant ship is subject to the supreme authority of its captain who will see that the wireless station is in good order of preservation, efficiency and cleanliness, and that the conditions of the present rules are strictly complied with.

ART. 24.—When ships are in port, the wireless station will be kept closed, the key to remain, in every case, on board in case the Maritime Authority should desire to make an inspection.

ART. 25.—Every station shall have the following documents:—

(1) The wireless station license.
(2) A copy of the present Rules.
(3) A copy of the "Berne Official List re Wireless Stations," together with its latest supplements.
(4) Range formularies, in the number required.
(5) Pages of range formularies.
(6) A copy of standing tariffs.
(7) A blackboard placed outside the wireless station wherein will be noted consecutively the wireless stations coming into the range of distance.
(8) A log of the wireless station.

CHAPTER IV.

Inspections.

Art. 26.—In pursuance of Art. 44 of the Navigation Law, the stations of all coast mercantile ships, both national and foreign, will be inspected every six months. To this effect the Maritime Authority will delegate its functions on those inspectors mentioned in the subsequent article, who will form part of the Inspection Committee.

Art. 27.—The Maritime littoral will be composed of a general inspection, stationed in Valparaiso, and four district inspections as follows :—

(a) Punta Arenas, covering the whole zone of the Estrecho and canals of Patagonia and Tierra del Fuego.

(b) Port Montt, covering all Chiloe and Moraleda canals, as far as the Penas Gulf, including Ancud Bay.

(c) Talcahuano, covering from Ancud as far as Talcahuano.

(d) Antofagasta, covering from Caldera up to the north.

In charge of the General Inspection will be the " Inspector of Wireless Telegraphy of the National Mercantile Marine." Such inspector will have under his jurisdiction the whole littoral of the Republic.

The district inspectors will be officials in the Navy, competent in wireless telegraphy, either in service or retired. These inspectors will be under their respective Maritime Authority, and are only inspecting the ships of their list, not out of the zones allotted to them.

In Valparaiso the wireless telegraphy inspector will inspect all the other ships.

Art. 28.—The district inspectors will, in all that concerns the obligations under their charge, be under the wireless telegraphy inspector, to whom they must send a report monthly of the ships inspected, giving particulars worth mentioning and suggestions as to the steps which should be taken.

Art. 29.—The Maritime Authorities will be able, when any infraction of the regulations or failure in the installation comes to their knowledge, to decree a special inspection, either by the corresponding inspectors, or in those ports without one, by an official on active service or retired, competent in wireless telegraphy, appointed for the purpose.

Art. 30.—In the half-yearly inspection mentioned in Art. 26, the inspector must pay special attention to the instruments of the station being in good condition, and to the efficiency being what is required of them, and also—

(a) To receive those complaints on the service of communications made by the company, captains, or passengers.

(b) To verify that the wireless set be syntonised to the waves of 300 and 600 metres.

(c) To ask for the presentation of the following documents :—

License of the wireless station ; to verify that the telegraphists are the number required, and that they are in possession of their titles ; to go through the communications records, and investigate any complaints received regarding infractions of the International Regulations, or others.

All of which must be recorded in the Navigation Certificate, without which requisite this will be valueless.

Art. 30a.—With regard to foreign ships, not included in Art. 26, the Maritime Authority of the first port at which the ship calls, will, in accordance with the International Convention dispose that the person indicated in Art. 29, shall effect an inspection, making sure that the ship carries the license from its respective Government in which the working of the wireless station is authorised, and that the operators possess the necessary titles.

Should not these documents be shown to them, the inspectors will be able to verify as to whether the installations comply with the conditions stipulated in the said Convention, and if the personnel is competent.

If such a visit could not be effected, through the want of an inspector, the Maritime Authorities of the other ports at which the ship calls will be advised of it.

Art. 30b.—Excluding the inspections indicated in Art. 26, the companies, shipowners, captains or proprietors, who require it, may apply in writing to the Maritime Authorities, for the inspection of the wireless stations on their ships, or for new installations being effected in them.

The corresponding authority will comply with the request in accordance with the circumstances and will at once communicate with the Maritime Territory Direction.

Art. 30c.—The tariff for the wireless telegraphy and telephony inspectors will be exclusively born by the vessel, and are as follows :—

Class of Work.	Wireless telegraphic and telephonic station up to 2 kw. power.	Wireless telegraphic and telephonic station above 2 kw. power.
	Dols.	Dols.
(A) Half-yearly inspection	20·00	30·00
(a) Study of plans and specifications of wireless stations to be installed.	150·00	200·00
(b) Inspection of a wireless station installation ..	250·00	350·00
(c) Installation of a wireless station	1000·00	2000·00
(d) Study of plans and specifications for repairs or alterations in a wireless station.	100·00	150·00
(e) Inspection of repairs or alterations in a wireless station.	200·00	300·00
(f) General inspection of a station in service, either compulsory or by application.	75·00	100·00
(g) Partial inspection of a station in service, either compulsory or by application.	50·00	75·00

The power of the stations to be taken at the terminals of the generator.

Art. 31.—Infractions of the regulations incurred by shipowners, companies or operators will be punished with fines for the benefit of the Naval Hospital, as under:—

Kind of Infraction.	Amount of the penalty or fine.
(*a*) Vessels not having any wireless set installed, as stipulated in the Regulations.	Sailing cancelled and fine of from $1,000 to $5,000 gold of 18 ct.
(*b*) Vessels with wireless sets installed on them, but without the necessary license, through not having applied for it, and for not having renewed that which has expired, or for not having asked for a duplicate of the one destroyed, thus testifying its destruction.	Sailing cancelled, fined with $500, the requisites to be complied with on payment of the fine.
(*c*) That vessel which is excepted from having a wireless set installed, but has not applied for its corresponding license of exception.	$150, the document to be applied for on payment of the fine.
(*d*) That vessel which being equipped with a wireless set lacks the necessary spare parts and tools (Art. 13).	$50 each time the infraction is discovered.
(*e*) That vessel which being equipped with a wireless set, has no efficient communication between the bridge and the station.	$25 each time the infraction is discovered.
(*f*) Any vessel making alterations in its wireless set without previously applying for an authorisation from the Maritime Authority.	$150 each time the infraction is discovered.
(*g*) Any vessel which, being equipped with a wireless set, does not possess emergency power (Art. 17).	$200, to proceed with such installation immediately upon payment of the fine.
(*h*) Any vessel which, being equipped with a wireless set, does not have the statutory number of operators, and these fail to comply with the provisions of Chapter III.	Cancellation of sailing for first offence, and $25 for each operator's infraction.
(*i*) Misemployment of the signal for help..	$5,000.
(*j*) False communications, talking, discussions, superfluous signals or interruptions (Art. 15, Clause (*a*), Section III).	$100.
(*k*) Any ship which, being anchored in port, uses its installation for directly communicating with other ships.	$500.
(*l*) Every infraction of the regulations not made by the operator himself but by other causes over which he has no control, or by express orders of the company, shipowners or proprietors (Art. 22, Clause (*b*), Section II).	$300 up to $1,000.

CHAPTER V.

Belligerency and Neutrality of the Wireless Stations.

Art. 32.—When the Republic of Chili is in a state of war, all wireless stations belonging to its mercantile ships will be requisitioned by the National Navy.

Art. 33.—When the Republic of Chili declares itself neutral in armed conflicts among other nations, those national and foreign vessels which patronise her shores will be subject to complying with the articles as laid down below.

Art. 34.—(*a*) No national wireless station will be allowed to maintain any relationship with either the foreign representatives or those of the Republic, nor demand or supply any information at all, other than through the medium of the Foreign Office.

(*b*) In some exceptional cases such relations may be directly cultivated, but to do so both the express consent of the Foreign Office and the assent of the Ministry of the Navy and General Army Direction will be required.

(*c*) All wireless telegraphy or telephony communications regarding the position of the merchant and war ships of the belligerent states, or any message capable of disclosing same, or mentioning their names, is strictly prohibited.

(*d*) Likewise is strictly prohibited the misuse of signals for help for the purpose of favouring a certain belligerent.

(*e*) Shipowners and merchant vessel commanders shall give all kinds of facilities to the inspectors and other persons appointed by the State, whether in war-time neutrality or belligerency, in order to control the telegraphic stations as dictated to them by the Government.

(*f*) The Government will be able, through the Ministry for the Navy, to give orders in such cases as in war time, neutrality or belligerency for the transmission of telegrams in ordinary language.

Art. 35.—Where belligerent states develop their hostilities in waters near the national shores, the following dispositions shall be strictly adhered to:—

(*a*) Any merchant vessel equipped with radiotelegraphic or telephonic apparatus, no matter of what nationality, navigating either within the Chilean littoral or lying anchored in Chilean ports, shall not in any way be able to use those apparatii.

(*b*) Any merchant vessel equipped with radiotelegraphic or telephonic apparatus, without regard to nationality, calling at any port or cover of the Republic, shall disconnect the aerial on casting anchor. Doors, windows, portholes and other means of access to the station will be sealed by the Maritime Authority. These seals can be broken as soon as the vessel leaves the Chilean littoral.

(*c*) Any vessel, both national and foreign, staying at a Chilean port for longer than three days shall have the aerial dismounted in the presence of the Maritime Authority, and be kept in the station under seal.

(*d*) Every operator on a national merchant ship who should become aware of any communications being sent contrary to these

regulations, is bound to inform the local Maritime Authorities at once, so that they may take the necessary steps.

(c) Any merchant vessel that, owing to long stay at a Chilean port, should require going through and cleaning its apparatus, can do so, upon obtaining a permit from the local maritime authority. The operation to be effected during working hours and in the presence of the said authority, who at the end of the work will again place the seals thereon.

ART. 36.—Where the belligerent persons develop their hostilities in waters distant from the national littoral, the following dispositions will strictly be adhered to:—

(a) Vessels with fixed sailings, following a route within the country, will be allowed to keep their aerials connected while lying in Chilean ports, provided that their stay is not longer than three days.

(b) The premises occupied by the station will be sealed only when so directed by the superior Maritime Authority.

(c) Those ships having no fixed sailings, or an established route in the country, whatever their nationality, shall, during their stay in Chilean ports, keep their aerials disconnected from the time they cast anchor.

APPENDIX No. 1.

License for Ship Wireless Stations.

1. In conformity with the General Regulations of the Radiotelegraphic Service, of the merchant ships approved by Supreme Decree No..... of.................. - of.................. Mr................. representative of the Company.................................. is authorised for a period of............ years and subject to the undermentioned conditions to instal and use a wireless set on s.s. ....of the Chilean Mercantile Navy, for the transmission and receipt of service messages, official and private, at a tariff not exceeding that fixed by the International Convention.

2. The employment of the apparatus authorised by this license, is subject to that which is established by the International Convention of Radiotelegraphy, ratified by the Supreme Government, and also to all the regulations dictated from time to time by the authorities, by Government decrees or by new treaties.

3. The firm or company in possession of this license should give all information demanded by the authority in the line of business concerned, in regards to entries and leavings (in accordance with the Radio International Convention), to messages exchanged between the ship and other stations, and will pay to the said authority, when and how it is so indicated, all sums appearing in the respective accounts.

4. During the working of the station, its apparatus will be in charge, or under the supervision of a person possessing the corresponding title, granted by the Maritime Territory Direction of the Navy.

5. The station will give absolute priority to signals of help or danger, and on receiving or making such signals all other transmission will be stopped and will not be renewed until the communications concerning the ship in danger have been concluded.

6. The station will be ready to transmit danger signals with a normal wavelength assigned by the Radiotelegraphic International Convention, and with sufficient power in order that these signals can be received a distance of 100 nautical miles.

7. The station will use the minimum of energy necessary to effect communications, except in the case of messages concerning ships in danger.

8. The station will exchange communications with any other ship, without distinction of the system of radiotelegraphic installation used.

9. The station should not be used when the ships are in harbour, except in case of danger.

10. The President of the Republic can authorise in war time, strikes, mutinies, etc, to close or dismantle the station, and also, to requisition the installation for the use of the authorities, granting an equitative bonus to the shipowners.

11. The Government inspectors or authorities will be able to inspect the wireless station when it is deemed necessary by the Maritime Territory Direction, or the Radiotelegraphic Inspection.

12. The installation should not be modified in any of the details specified in the form below.

Form of the Station and its Apparatus.

Ship....................................
Number..................................
Shipowners..............................
Registered Port.........................
International Characteristics...........
Radiotelegraphic Characteristics........
Class of Service...............Hour........
Power, primary transformer.............kw
Power of the generating dynamos..........
Normal day range with other ships at sea, in nautical miles.........................
Tariff on board per word.................
Minimum per radio........................
System employed..........................
Characteristics of the transmitter used....
....
Type of oscillator.......................
Approximate frequency of spark...........
Characteristics of the receiver..........
Type of receiver.........................
Scales of waves of the receiver..........
from............ metres............ up to........... metres............
Aerial, number of masts..................
Height................Type of aerial........
Wire................ Number..............
Diameter and class............
Dimensions required......................
Emergency apparatus............Type......
Power of the battery.....................
Day range at sea.........................

Wavelength.

The normal wavelength for the transmission and receipt will be of 600 metres, the station will be for the use of two waves, one of 600 and the other of 300, such as it is stipulated in the International Radiotelegraphic Convention, and the position of the syntoniser for such waves should be clearly marked.

Where the transmitter radiates two or more waves as indicated by a sensitive wavemeter, the energy of the smaller one shall not exceed 10 per cent. of the energy of the larger one; the logarithmic decrement per complete oscillation, not to be over 0.2, except when signals for help are transmitted; in such cases the transmitter can be syntonised in order to produce a maximum of interference, with a maximum of radiation.

Length of Wave.	Current Wave Amperes.	Decrement.	Reading of the wavemeter.	
			Principal Wave.	Next wave to the principal one.
600 metres 300 metres				

This license will expire on the.............. of.............

....
Radiotelegraphic Inspector.

....
Director of the Maritime Territory.

....
Minister of War and the Navy.

APPENDIX No. 2.

REPUBLIC OF CHILE.

TERRITORY MARITIME DIRECTION OF THE NAVY.

TITLE.

For wireless operator of......................
Class...
Inasmuch as ....
has passed the examination satisfactorily in the following subjects :—

(*a*) Handling, fitting and care of radio-telegraphic apparatus and batteries of accumulators.

(*b*) Transmission and receipt by ear at a speed of............words per minute.

(*c*) Knowledge of the radiotelegraphic service international regulations.

He is granted the title of wireless telegraph operator, Class ...... valid for five years.
Valparaiso............de......................
....
....
Note taken on.................................
....
Radiotelegraph Inspector General............
..................Maritime Territory Director
....

SECTION III.

RADIO COMMUNICATIONS.

CHAPTER. I.

GENERAL DISPOSITIONS.

C ART. 1.—For the purposes of public correspondence between two ships and between these and the land stations, only the 300 or 600 metre wave shall be used; this limitation may, however, be increased by the Supreme Government when circumstances warrant it.

ART. 2.—Ship and land stations, open to public service, are under the obligation of communicating with one another when one of them so desires.

ART. 3.—Both Chilean and Mercantile foreign vessels navigating along the coast of the Republic, should give preference to official messages of the Chilean national Navy.

Private or public service radiotelegrams, transmitted by mercantile ships, for their part, will have precedence over communication practice among the wireless stations of the Navy, except during the hours applied for by the Naval authority.

ART. 4.—When it is desired to communicate with a land radiotelegraph station, the nearest one must be chosen. There being a range assigned to a distant land radiotelegraph station, it is necessary to wait until this is the nearest.

ART. 5.—Every station is obliged not to interfere with the communication of the other stations. To this end it is prohibited to exchange conversations, not connected with the service, among operators.

Likewise it is prohibited to send long series of signals for the syntonisation of the transmitting and receiving apparatus, these operations to be made by means of the trial vibrator. Where it is absolutely necessary to send trial signals, these should be confined to short series, and only after verifying that no other communications are being sent.

ART. 6.—Before starting a call, the wireless station will syntonise its receiver to the regulative wave and will at the same time verify that no communication is being made; otherwise will await the first suspension, unless its call does not disturb the said communication. The same rule will be observed when a call from another station is to be answered.

ART. 7.—(*a*) Calls for help have priority over all other signals.

(*b*) As soon as the call for help is perceived all communications will be suspended and will not be resumed until the ship applying for help has finished transmitting its signal.

(*c*) When a ship making use of the signal for help, adds, after a series of these signals, the characteristic of a certain station, the obligation of answering devolves in the first place upon the said station.

(*d*) When there is no such indication of characteristic, every vessel perceiving a call for help will answer it immediately. By so doing interference from other radiotelegraph stations will be avoided.

(*e*) Only one ship must answer at a time.

(*f*) That ship which believes itself nearest to the danger, will take precedence in its communications over the others (if there are any).

ART. 8.—Those regions wherein the radio telegraphic service is very considerable (Mancha Sea, etc.), a ship's call to a land radiotelegraph station will, generally speaking, not be made except when the latter is within normal distance of the ship radiotelegraph station, and when the ship reaches a distance inferior to 75 per cent. of the normal range of the said land radiotelegraph station.

ART. 9.—When two or more ships call at one time, the nearest land radiotelegraph station will indicate the order in which the radios are to be transmitted, paying attention to the convenience that the interchange of messages is the maximum, and giving preference to the ship which by its position, destination and speed, will be the first to leave its radius of communication.

ART. 10.—(*a*) If in spite of the precautions indicated, interference in the radio communications are produced, the land radiotelegraph station, to which the previous article refers, will give the order to wait, giving the approximate duration, and the ship stations are obliged to obey the order.

(*b*) The ship station will inform the land station of the moment in which it proposes to suspend its communications with other stations, as well as the probable duration of the interruption.

(*c*) To this respect, it must be borne in mind that the land station is the one which has the command of the communications.

ART. 11.—In case of repeated omissions to comply with this regulation on the part of foreign vessels in communication with the Chilean coast, the necessary steps to punish the culprit will be taken with that Government under whose flag the ship sails. It is the duty of operators on board the Chilean mercantile vessels to record such omissions on their logs, and inform the captains, in order that they may lay these facts before the Naval Authorities.

ART. 12.—The land wireless stations, as it has been directed, will command the public radiotelegraphic service within the radius of its range, excepting the central region of the country, where the said command is performed by the controlling station. In case of danger, the ship station which sends danger signals is the one that commands the communication.

ART. 13.—In the Chilean coasts, in case of war, mutinies, or others to be dealt with by the Naval Authorities, the Chilean fleet will take command of the radio communications in those regions in which they are operating. In such circumstances, all ships either foreign or Chilean, will obey the orders emanating from the said fleet.

ART. 14.—The radio stations are obliged to send the radios when no direct communication can be established between the station of origin and the receiving station, provided that they are in the position of being able to send them.

ART. 15.—(*a*) Those radiotelegraphic installations on board merchant vessels anchored in the ports of the Republic, where there is a land station, cannot be used for communication with ships other than through the medium of the land station, except in the case of signals for danger.

(*b*) Any talk, discussion or superfluous signals through the radiotelegraph is strictly prohibited, the communication is to be limited to what is necessary for a good service.

(*c*) Similarly, it is prohibited to interrupt a conversation between two stations in order to call a third one, save in the case of danger, or when it is a question of a call for "general stop." In such cases it will be necessary to wait till the transmitting station has finished, to begin immediately afterwards the call in question.

(*d*) All communications, except in the case of signals for help or danger, are prohibited, when the ship is anchored in any port of the Republic.

CHAPTER II.

ACCEPTANCE, TAXATION AND PAYMENT OF RADIOTELEGRAMS.

ART. 16.—(*a*) It is prohibited either to add to, or withdraw any words or punctuation signs from the messages, it is only allowed to add the customary notations of the service.

(*b*) When the message has not been written on the radiotelegram regulation form, the paper containing it will be affixed to the said form.

(*c*) When the drawing up or writing of a radiotelegram is not sufficiently legible, the radiotelegraphist will call the attention of the sender in order to make the respective corrections. A similar procedure he will observe in case of their being errors in the spelling.

ART. 17.—The messages will be classified in three categories, namely :—

(*a*) Officials.—Those from the Government, Commander-in-Chief of the Fleet, Commander-in-Chief of the Land and Diplomatic Forces.

Those relating to the safety of the State or public order, and those of exceptional urgency, such as wrecks, fires, earthquakes, or other calamities, communicated by the authorities, or addressed to them, and the replies to them.

(*b*) Service.—Those received from the inspectors and sub-inspectors of the national radiotelegraph service; those exchanged by the captains between one ship and another, for mutual information concerning the conditions of the navigation; those exchanged by the captains with the maritime authorities, or *vice versa*, with the same object; those radios of the service not rated as well as the meteorological ones.

(*c*) Private.—Those intended for public correspondence. In these are included press messages and rated service notices.

ART. 18.—Generally, the radiotelegrams are transmitted in the order that they are received; but subject to their category, the following scale will be adopted :—

(*a*) Official radios, priority to urgent ones.
(*b*) Service radios, priority to urgent ones.
(*c*) Private radios, priority to urgent ones.

ART. 19.—(*a*) Every national ship in communication with any station, will number each radio, beginning with number 1 to 0 hours of the first day of each month. This number will be determined in accordance with the order set out in the previous article.

(*b*) In the retransmission of messages, two numbers will be sent as a maximum; first, the number of the original station, and, second, that of the station concerned, and separating both by a fraction mark.

ART. 20.—The parts composing a message, in the order of their transmission, are as follows :

(*a*) Preamble and special remarks not rated.
(*b*) Special remarks rated.
(*c*) Address.
(*d*) Text.
(*e*) Signature.

ART. 21.—The preamble is composed of :—

(*a*) Prefix :—These are—"S" for official radios; "A" for service radios; "ST" for rated service radios; "Z" for press radios; and "D" for urgent radios.

(*b*) Name of the office of destination.

(*c*) Word "of" followed by the name of the office of origin.

(*d*) Number of the radio's origin.

(*e*) Number of rated words.

(*f*) Total number of rated and unrated words.

(*g*) Date and hour handed in. The hours are counted from 0 to 24, beginning at midnight.

(*h*) Special remarks not rated, such as :—Route to follow, course followed (when it is not clear), wording maintained (when it is confused).

ART. 22.—Following the preamble and before the address, the rated special remarks, are transmitted, as—"RP" "fr"......... reply paid............words.

These remarks are rated and count as one word.

ART. 23.—The address is made up of :—

(*a*) Name of the addressee; and

(*b*) Place of destination and address, and

other indications for facilitating the delivery of the radio (in accordance with the international list of offices).

ART. 24.—The text of a radiotelegram can be rendered :—

(*a*) In a known language.

(*b*) In secret language. The latter is divided into agreed code and cipher code. The messages might be set out entirely in either one of these languages, or in conjunction with one another.

ART. 25.—The signature, as also the address and the text, must be written in legible form. The signature is not compulsory.

ART. 26.—(*a*) *Address*.—As concerns the rating of the words, this will be as follows :—

(1) All the words written by the sender to be counted.

(2) The name of the station or office of destination will be counted as one word, whatever the length.

(3) When the name of a country, province, department, etc., or district (shown in the International List) is added, to distinguish one office from another of the same name, the words will be joined together to form one, which will be transmitted and rated as one word.

(4) The name of a country or district will be charged for if the sender should add it on unnecessarily.

(5) The remainder of the address will be charged for in accordance with the rules for counting the words in common language.

(*b*) Text.

(1) *In common language*.—The maximum of letters allowed per word is 15 ; if a word is composed of more than 15 letters it will be charged as two words.

Those words from which one or two letters have been suppressed, as against the use of the language will not be admitted.

(2) *Agreed Code*.—In agreed and commercial codes, recognised by telegraphic administrations, messages are counted and charged for at the rate of 10 letters per word.

(3) *Cipher Codes*.—In secret and cipher codes messages are counted and charged for at the rate of five letters or numbers per word.

(*c*) *Signature*.—The signature, when it is sent, will be charged for in accordance with the rules given for the common language.

ART. 27.—(*a*) Ordinary compound words and names of towns, provinces, countries, etc., as well as names of ships, or families, will be charged for as a word, when they are joined (without dash), and provided that they do not contain more than 15 letters.

(*b*) Compound words joined with a dash or apostrophe, are counted according to their number ; the dashes or apostrophes will be charged for as additional words, should the sender insist on their transmission.

(*c*) When the name of a street, circus, etc., is made up of several words and written as one, it will be computed as one word, provided it does not contain more than 15 letters ; but the expression "calle," "plaza," "avenida," "street," "strasse," "rue," "boulevard," etc., will be counted as one additional word for the purpose of the rating.

(*d*) In German and Dutch languages the words strasse, platz, stratt, can be joined to the name of the street or circus, and then, they will not be charged as additional words, if the combination does not exceed 15 letters.

(*e*) Compound numbers, in a form contrary to the general use of the language (for example, doscientos diez), will be admitted as only one word when they do not exceed 15 letters.

ART. 28.—(*a*) Radios set out, partially in ordinary language and partially in code, will be charged at the rate of 10 letters per word, in both cases.

(*b*) The groups in cipher code, sent in this class of message, will be counted at the rate of five letters or ciphers per word.

(*c*) When a radio is entirely written in ordinary language and cipher groups, the first will be counted at the rate of 15 letters per word, and the second at the rate of five (letters or ciphers) per word.

ART. 29.—(*a*) The dashes or strokes that are only intended to separate the different words or groups composing a radio are not to be transmitted or charged for.

(*b*) Punctuation signs, apostrophes or dashes (except when used in the formation of numerals, commercial marks, etc.), will only be transmitted if the sender desires it ; in such a case the said signs will be counted and rated as isolated characters.

(*c*) When a word or phrase is underlined, it is rated and counted as an additional word.

(*d*) The two parenthesis signs, () and the inverted commas "" will be counted as one word.

(*e*) Interrogation ? and exclamation ! signs will be counted as one word.

ART. 30.—(*a*) *Isolated characters*.—Whether a letter or cipher, it will be counted as one word.

(*b*) *Groups of characters*.—(Letters or ciphers).—Those groups of letters forming commercial marks, or expressions, such as, CIF, FOB ; groups of letters of current use, such as RSVP, RIP, QEPD, and groups of ciphers, will be counted at the rate of five letters or ciphers per word.

(*c*) *Combined groups of characters*.—(Letters and ciphers.)—Combinations of ciphers and numbers forming commercial marks, or number of a house, such as B Bis, OA3, 13A, will likewise be counted at the rate of five characters per word.

(*d*) *Groups in the Address*.—Such will not be accepted and any other letter in excess of those forming names or words, will be surcharged and counted as separate words.

(*e*) *Letter Ch*.—The combination of Ch, which is counted and transmitted as only one letter in the ordinary language message, or agreed code of words in a known language, will be rated as two letters in those of cipher and agreed code formed by words of no particular language.

(*f*) *Groups with punctuations, signs, and fraction marks*.—The groups wherein appear full-stops, commas, dashes and fraction marks to form commercial expressions will each be counted as one letter or cipher.

ART. 31.—The rates payable in the Chilean coast will be as follows :—

(*a*) By merchant ships the rate of 40 centimes per word, with a minimum value corresponding to ten words.

(*b*) For land stations, at the rate of 60 centimes per word, with a minimum value corresponding to ten words.

ART. 32.—(*a*) *Radios exchanged between two merchant ships*.—The rate for the radios exchanged between merchant ships, without the intervention of a land station, will comprise the rates on board the ship of origin and destination, supplemented with the rates on board the intermediary stations.

(*b*) *Radios from a mercantile ship to a land*

station.—When a radio sent from a ship to a and station passes through one or two ship stations, the rate includes, besides that of the ship of origin, that the coast station and that of the telegraphic lines, the rate on board of each of the ships that have taken part in the transmission.

(*c*) *Radios from a merchant ship to a warship, or vice versa.*—The radios exchanged between a merchant ship and a national warship, will be subject to the same rates as above, except when it concerns officials, classes or crews of the warships, in which case these will only pay the corresponding tariff to the merchant ship and that of the warship, which is 500 centimes per word.

(*d*) *Reply paid.*—Private radios with reply paid, besides the rate for sending the radio, will pay the corresponding amount for the said reply.

ART. 33.—Any difficulty that may arise in rating private radios, in other cases than aforementioned, will be dealt with in accordance with Articles 16, 17 and 18, Chapter IV, of the Service Regulations annexed to the International Radiotelegraph Convention.

ART. 34.—Shipowners, proprietors, or shipping companies will render monthly their accounts to the General Direction of Telegraphs, when their ships have sent messages through the medium of the land stations, or by way of the State Telegraph lines.

ART. 35.—(*a*) *Radio Record Book of the Station.*—In this book will be noted the following particulars of the radios: Number of origin, total number of words, hour handed in, situation of the ship of origin, if known, hour of transmission, hour of reception, special remarks and signature of the operator. The text will not, therefore, be written.

(*b*) *Filing of radios.*—The originals of the radios, together with the documents relating to them, will be kept at least eighteen months in the station of the ship.

(*c*) EXAMPLE OF COMPUTATION OF WORDS:—

Words.	Number of Characters.	Number of words rated.	
		Address.	Text.
New York	—	1	2
Newyork	—	1	1
London England (word England unnecessary)	—	2	2
Peña Blanca San Fernando (name of an office)	—	1	4
Calle Barros Arana	—	3	3
Calle Barrosarana	—	2	2
Callebarrosarana (contrary to the use of the language)	—	2	2
Leipziger Platz	—	2	2
Leipzigerplatz	—	1	1
Kronprinzessin Cecilie DKA (name of an office)	—	1	3
Maipo CAB or Maipo CBU (name of an office)	—	1	2
Kronprinzessincecilie	21	1	2
Van de Brande	—	3	3
Vandebrande	—	1	1
O'Higgins	—	2	2
Ohiggins	—	1	1
13½	5	1	1
133½	6	2	2
137th or 1374°	5	1	1
1374th or 1374me	6	2	2
106A (number of a house)	4	1	1
46231	5	1	1
46·231	6	2	2
29/32	5	1	1
34·38	5	1	1
2 %	4	—	1
2 p %	—	—	3
197A/199A (company mark)	9	2	2
Ch23 (company mark)	4	—	1
G.H.F. (company mark)	6	—	2
GHF45 (company mark)	5	—	1
2 p.m.	—	—	2
2.15 p.m.	—	—	2
N42E (demarcation of a ship) (three groups)	—	—	3
75·23 O. 24·15 S. (position of a ship) (four groups)	—	—	4
158·12 E. 24·15 S. (position of a ship) (five groups)	—	—	5
Radiotelegraphy	16	2	2
Radiotelegraphy (underlined)	—	3	3
Sextyzlargs (ciphered code)	11	—	3
398490 (ciphered code)	6	—	2
23877 (ciphered code)	5	—	1
Accentuated (agreed code)	10	—	1
Electricano (agreed code)	11	—	2
(For example)	—	—	3
" Mercurio " (the inverted commas counting as one word)	—	—	2
¿ Por que ? (each sign of interrogation is counted as one word)	—	—	4
Diec ocho	—	1	1
Diez y ocho	—	3	3
Cientoochenta (international computation)	—	1	1

Words.	Number of Characters.	Number of words rated.	
		Address.	Text.
Centochenta (contrary to the use of the language) as per the State Telegraph	—	2	2
Sinembargo	—	—	1
Aujourdhui	—	—	1
Aujourd'hui	—	—	2
Formula b	—	—	2
E M (isolated letters, initials of surname)	—	2	2
EM (ditto, joined abusively)	—	2	2
A bordo	—	2	2
Abordo	—	1	1
Enseguida	—	—	1
Contralmirante (contrary to the use of the language) ..	—	2	2
Contralmirante	—	1	1
Aunque	—	—	1

CHAPTER III.

Transmission and Reception of Radios.

Art. 36.—(*a*) The International Morse Code signals will be used, and the speed of transmission will be more or less 20 words per minute, reckoned at the rate of five letters per word.

(*b*) The International Code of Signals which was originally prepared for flag signals is sometimes used in radiotelegraphy between ships of different nationalities.

(*c*) For notices and enquiries of the service, the operators will make use of the Radiotelegraphic Code of Abbreviations annexed to the Service Regulations of the Radiotelegraphic International Convention.

Art. 37.—The following signals will be used :—

(*a*) Preliminary call — • — • —
(*b*) Separation — • • • —
(*c*) Invitation to transmit — • —
(*d*) To wait • — • • •
(*e*) Acknowledge receipt • — •
(*f*) End of transmission • — • — •

Art. 38.—(*a*) The call consists of :—

(1) The preliminary call — • — • —
(2) The characteristic of the destination station, repeated three times, and
(3) The word "of" followed by the characteristic of the transmitting station, repeated three times.

(*b*) The destination station replies as follows:—

(1) Preliminary call — • — • —
(2) Characteristic of the original station, repeated three times.
(3) Word "of" followed by its own characteristic.
(4) Invitation to transmit — • — in case it is ready; otherwise, the signal to wait • — • • • followed by a cipher, indicating the number of minutes he has to wait.
(5) End of transmission • — • — •

Art. 39.—The steamship *Maipo* "CDH" wishes to transmit a radio to the steamship *Cachapoal* "CDF."

(*a*) *Call.*—The *Maipo* will send the following signal : — • — • —
CDF CDF CDF — • • • CDH CDH CDH.

(*b*) *Reply.*—The *Cachapoal* will reply :
(1) — • — • — CDH CDH CDH — • • • CDF — • — in case it is ready for communication.
(2) Otherwise, if the stop is of five minutes, will reply :
— • — • — CDH CDH CDH — • • • CDF • — • • • • • • • • • — • — •

Art. 40.—If after having repeated the call three times, with an interval of two minutes the station of origin does not receive a reply it will call again in the same manner after 15 minutes, provided that no other communication is being sent.

Art. 41.—Every station on board that calls a land station, after complying with what is set out in Art. 39, will make known :—

(*a*) The distance of the ship, in nautical miles, from the coast station.
(*b*) The position, in concise form.
(*c*) The next port it is making for.
(*d*) The number of radios of normal size, if they are of exceptional length, or the number of words.
(*e*) The speed per hour will not be indicated unless it is expressly asked for by the coast station.

Art. 42.—The s.s. *Maipo* "CDH," on a voyage to Callao, is situated at 150 miles to the north of Valparaiso, CCE station, the radiotelegraph station being at 170° exactly, and has 75 words to be transmitted.

After calling and receiving the invitation to transmit, it will act as follows :—
— • — • — CCE from CDH — • • • — QRB 150 QRC 170 QRD Callao 75 • — • — •

Such communication is called time rush ("T R"), and appears jointly with QRB QRC and QRD in the abbreviations list annexed to the present Regulations.

Art. 43.—The reply from the land station may be in any one of the following examples :—

(*a*) — • — • — CDH from CCE R TR 50 QSG • — • — • (meaning "time rush received. I have radios with 50 words for you; transmission will be made by series of 5 radios)."

The station on board will acknowledge receipt, and the one on land will transmit five radios, provided such transmission does not exceed 15 minutes.

(*b*) — • — • — CDH from CCE R TR 50 QSG — • — (signifying : "received time rush. I have radio with 50 words ; transmit").

The station on board will transmit the five messages, provided it does not take longer than 15 minutes in transmitting it.

(*c*) — • — • — CDH from CCE R TR 50 QSF • — • — • (meaning : "received time rush. I have radios for you with 50 words ; will transmit messages, alternating with one another").

The station on board will acknowledge receipt and that on land will transmit its first message ; the ship will forthwith acknowledge

receipt again, transmitting in its turn its first message, and so on alternately.

(*d*) ▬ ● ▬ ● ▬ CDH from CCE R TR 50 QSF ▬ ● ▬ (*i.e.*, "received time rush. I have radios for you with 50 words; the transmission will be made alternatively. You first."

The station on board will begin the transmission of its first message, and once the acknowledgment is given by the coast station, this, in its turn, will proceed to give its first message.

When radiotelegrams are exchanged between two ships the fixing of the order of transmission devolves upon the ship called up.

Art. 44.—(*a*) Every transmission of messages will be preceded by the signal ▬ ● ▬ ● ▬ and ended by ● ▬ ● ▬ ● followed by the characteristic of the station of origin and the signal ▬ ● ▬

(*b*) When messages of over forty words are transmitted, the station of origin will be able to interrupt the transmission, by using the sign of interrogation ● ● ▬ ▬ ● ● after each series of twenty words, and will not be able to begin again while the station of destination does not repeat correctly the last word, followed by the invitation to transmit ▬ ● ▬

(*c*) In the transmission of series of messages, the characteristic of the station of origin and the signal ▬ ● ▬ will only be given at the end of the said series.

Art. 45.—After assigning to the radio the number corresponding to it, and verifying the number of words and hour handed in, the transmission of the message will be proceeded with as follows:—

(*a*) *Process.*—Signal of preliminary call, prefix (if there is any), radio number of the ship or origin, number of the radiotelegram, number if words, date and hour handed in, service instructions (if there is any), separation signal, eventual observations (if any), separation, address, separation, text, separation, signature, sign of the end of the message, characteristic of the station (ship) transmitting invitation to transmit.

(*b*) *Example.*—▬ ● ▬ ● ▬ radio Aysen, 1-10-12 (12th day of the month) 9.35 (9.35 hours) ▬ ● ● ● ▬ Gutiérrez, Prat Street, Valparaiso ▬ ● ● ● ▬ will arrive to-morrow at 3 p.m. ▬ ● ● ● ▬ Gonzalez ● ▬ ● ▬ ● CDB ▬ ● ▬

Art. 46.—Once the radio is assigned a number, it will be transmitted as follows:—

(*a*) *Process.*—Signal of preliminary call, prefix (if any, radio, number of the office of origin, number of origin, followed by fraction mark and number assigned to the radio by the land station, number of words, date and hour of deposit, instructions of service (if any), separation, eventual indications, separation, address, text, signature, signal of end of message, characteristic of transmitting station and signal of invitation to transmit.

(*b*) *Example.*—▬ ● ▬ ● ▬ radio Valparaiso, 915-1 13-12 12 9.35 ▬ ● ● ● ▬ Riveros Aysen Valparaiso ▬ ● ● ● ▬ will go on board to meet you. Please take freight No. 215bis ▬ ● ● ● ▬ Gomez ● ▬ ● ▬ ● CCE ▬ ● ▬

Art. 47.—Presume that the ship *Huasco* retransmits the official message No. 5, with 16 words, as per telegraphic computation, but with only 13 actual words, which was deposited in the wireless station of the cruiser *Chacabuco*, on the 12th day of the month, at 9.35.

(*a*) *Process.*—Signal of preliminary call, prefix "S," radio, name of office, ship or station of origin, number of the radiotelegram, number of words, date and hour handed in, service instructions, separation, incidental remarks (if any), separation, address, separation, text, separation, signature, end of message, characteristic of the transmitting station, signal of invitation to transmit.

(*b*) *Example.*—▬ ● ▬ ● ▬ S radio *Chacabuco* 5-16-13 12 9·35 *via* steamship *Huasco* ▬ ● ● ● ▬ General Director of the Navy, Valparaiso ▬ ● ● ● ▬ Fleet anchored safely cymrxz ohtlrd cadmzw ▬ ● ● ● ▬ Admiral Gomez ● ▬ ● ▬ ● CDC ▬ ● ▬

Art. 48.—(*a*) When a radio is received, the words will be counted, and if this coincides with the number given, an acknowledgment of receipt in conformity will be sent, using the letter R, followed by the numbers of the message, as follows:—CDC ● ▬ ● 19 CDH (station of origin. Received in conformity. Station of destination).

(*b*) The acknowledgment of receipt in the messages by series will be given after the transmission of each radio.

Art. 49.—The date and hour will be pointed out by means of two groups of ciphers, the former being transmitted first, and then the latter with its minutes.

Thus, the 12th day, 2.45 p.m., will be transmitted as follows:—

12 14 45

Art. 50.—When the true quantity of words is different to that rated, it will be marked out as a fraction, first transmitting the number of words rated followed by the fraction mark and by the true number of words.

If a message has 20 words, but for the purposes of rating is counted as 22, it will be transmitted as follows:—

22 ▬ ● ● ▬ ● 20

Art. 51.—(*a*) The end of correspondence between two stations will be marked out by the signal ● ● ● ▬ ● ▬ followed by the characteristic of the transmitting station.

(*b*) It is strictly prohibited to use the word "nil."

Art. 52.—(*a*) Example of transmission:—

(1) *Message.*—On November 4th, the Chilean s.s. *Huasco* wishes to transmit to the land station at Valparaiso, the following message: No. 16; hour of deposit, 2.15 p.m. Number of words rated, 15; actual number, 13.

Jiménez—Echaurren 516 Santiago—Buy 100 coal shares "Curanilahue" price 162½—Gonzalez (inverted commas maintained by the sender).

(2) *Transmission.*—Such message will be transmitted as follows:—

▬ ● ▬ ● ▬ radio Huasco 16 15/13 4 1415

▬ ● ● ● ▬ Jiménez Echaurren 516 Santiago.

▬ ● ● ● ▬ Please buy 100 coal shares Curanilahue.

● ▬ ● ● ▬ ● price 162 one/2 ▬ ● ● ● ▬ Gonzalez ● ▬ ● ▬ ●

(*b*) *Reception in conformity.*—The receiving station will, after verifying the number of words, transmit the acknowledgment of receipt, as follows:—▬ ● ▬ ● ▬ CDC ▬ ● ● ● ▬ R 16 15/13 ● ▬ ● ▬ ● CCE ▬ ● ▬

In the case of messages having words in code, these will be repeated when acknowledging receipt.

(*c*) Reception not in conformity—

(1) Doubtful reception of a part of the message.

If by any circumstance the words following "carboniferas" (coal) are not received, the repetition will be asked for, thus :—

CDC ▬ ● ● ● ● ▬ carboniferas (coal) ● ● ▬ ▬ ● ● CCD ▬ ● ▬ The transmitting station will reply CCE carboniferas (coal) ● ▬ ● ● ▬ ● Curanilahue ● ▬ ● ● ▬ ● price 162 one/2 ▬ ● ● ● ▬ Gonzalez ● ▬ ● ▬ ● CDC ▬ ● ▬.

(2) *Error in the number of words.*—If the receiving station is not agreed upon the number of words, it will signal it thus :— ● ▬ ● ▬ ● CDC 14/12 ● ● ▬ ▬ ● ● CCE, presuming it has not received the word 162.

The transmitting station will repeat the message, giving only the first letter of each word, so as to enable the receiving station to verify where the mistake is and ask for a repetition accordingly.

Art. 53.—(*a*) When the signals are doubtful and weak every device must be taken to effect the transmission.

(*b*) The last radio can be repeated as much as three times, if the receiving station so demands, and, if in spite of such threefold repetition the signals are still illegible, the message will be given up as cancelled.

(*c*) If no acknowledgment is received, the transmitting station will call as many as three times, and failing to receive an answer the communication will be abandoned.

In such cases the transmitting station has the right of obtaining an acknowledgment by a service notice sent through the intermediary of another station in the country, or even by utilising the telegraphic lines of the State.

(*d*) If, in spite of the bad reception, the receiving station esteems that the message could be sent, the acknowledgment will be given, adding at the end of the preamble the words "doubtful reception."

(*e*) In the event of the ship transmitting again the radio to another station of the same administration, only the rates corresponding to one transmission will be charged.

Art. 54.—When a radio contains numbers, difficult names, or doubtful words, it will be transmitted slowly in order to avoid errors.

All doubtful words and numbers will be repeated on acknowledging receipt.

Art. 55.—All radios in Code will be repeated by the receiving station; this does not acknowledge it until it receives the confirmation of the transmitting station.

Art. 56.—(*a*) The preamble of a notice consists of :—

(1) The prefix A.

(2) Names of the offices (or stations) of destination and origin, separated by the word "of."

(3) The date and hour of deposit.

(4) Service notices do not bear either numbers or signature in the transmission, but it is the duty of the operator transmitting a notice, to sign the formulary with his initials.

(*b*) In the text of a service notice exchanged between a ship and a land station, the radiotelegram, giving the notice of service, will be designated by :—

(5) The number of origin, and serial (as the case may be).

(6) The date written in words, and not in ciphers.

(7) The name of the addressee (and his address in case of non-delivery).

Art. 57.—(*a*) The station on board informs the station of origin that the radiotelegram could not be delivered to the addressee. ▬ ● ▬ ● ▬ To Constitucion from ABC 15 11 55 ▬ ● ● ● ▬ 321 5 fourteen Guzman addressee is not on board ● ▬ ● ▬ ● ▬ ● ▬

In this message Constitucion is the office of origin of the radiotelegram, which is informed that Guzman, the addressee, is not on board the ship, the characteristic of which is ABC. The ciphers 15 11 55 stand for the date and hour of deposit of the service notice ; and the word "fourteen" (catorce) gives the date of the radio under consideration, whose number of origin is 321, and the serial assigned to it in the land station is 5.

(*b*) The ship station, having received a notice of non-delivery, discovers an error in the transmission of the address, and then sends a service notice, rectifying the said address, thus, ▬ ● ▬ ● ▬ To Limache from ABC 15 3 15 S ▬ ● ● ● ▬ 15 fourteen (catorce) read Ayala calle Blance 38, I repeat 38 ● ▬ ● ▬ ● ▬ ● ▬. This indicates that there has been an error in the number of the house, which should read 38 instead of the number previously indicated.

(*c*) Some of the words and phrases in current use in service notices, are given hereunder :—

Spanish.	English.	French.
Destinarario.	Addressee.	Destinataire.
Desconocido.	Unknown.	Inconnu.
Se fué.	Left.	Parti.
No está a bordo.	Not on board.	Pas a bord.
Ya no está a bordo.	No longer on board.	Plus a bord.
Muerto (difunto).	Deceased.	Décédé.
No estáregistrado.	Not registered.	Pas en registré
Rehusado.	Refused.	Refusé.
Para.	For.	Pour.
Repita.	Repeat.	Repetez.
Ya.	Already.	Déja.
Entregada.	Delivered.	Remis.
Remita.	Deliver.	Remettez.
Anula.	Cancel (or annul).	Annulez.
Respuesta pagada.	Reply paid.	Repose payée.
Léase.	Read.	Lisez.
Reemplazar.	Replace.	Remplacer.
Colacionado.	Radiotelegram be repeated.	Collationnement.

Art. 58.—(*a*) Call for help : SOS.

Ships in danger will make use of the signal for help : ● ● ● ▬ ▬ ▬ ● ● ● repeated at short intervals and followed by the particulars required.

(*b*) General call : CQ.

(1) When it is desired to enter into communication with any radiotelegraph station, whose characteristic is unknown, the general call will be used :—

▬ ● ▬ ● ▬ ▬ ● ▬

followed by the word "of" and the characteristic of the station of origin, repeated three times.

(2) Every station receiving this signal, will reply as laid down in Clause (*b*) of Art. 39.

(*c*) Call for general stop : F.

(1) When a radio station receives the signal ● ● ▬ ● repeated three times and at intervals, it should immediately suspend all radio communications, for this order proceeds from the Chilean Navy.

(2) The only exception to this rule is when a signal for help is received.

(3) The general stop will last until the naval station, which ordered it, removes it.

(*d*) Call for using International Code: PRB. The characteristic of one station, followed by the signal: ·–––· ·–· –··· signifies that the ship or station calling, wishes to communicate with the station called by means of the International Code of signals.

SECTION IV.

School for Mercantile Radiotelegraph Operators.

Examinations and Titles.

CHAPTER I.

Working of the School for Mercantile Radiotelegraph Operators.

Art. 1.—The purpose of the School for Mercantile Radiotelegraph Operators is:—

(*a*) To instruct and form the staff of operators intended for service in the National Mercantile Navy.

(*b*) To keep the general statistics of the staff of operators existing in the National Mercantile Navy.

Art. 2.—The School of Operators for the service of the Mercantile Navy will be directly dependent upon the Maritime Territory Direction of the Navy, and all communications of whatever kind such may be, will be made through the intermediary of that authority.

Art. 3.—The school will be domiciled in the premises which the Maritime Territory Direction will set up for the purpose.

Art. 4.—The school for operators will be equipped with the following elements:—

(*a*) A library of educational books for the instruction of the staff.

(*b*) Morse manipulators, electromagnetic vibrators, dry cells, and pairs of receivers in sufficient number as there are students.

(*c*) An Omnigraph apparatus for transmission.

(*d*) Office and school apparatus.

(*e*) Tools and other articles for experiments and practical teaching.

Art. 5.—The teaching staff will be as follows:

(*a*) A director of the course who might be the radiotelegraph inspector.

(*b*) A teacher of electricity, radiotelegraphy, practical working, and mastery of the regulations, and

(*c*) A Morse instructor.

Art. 6.—The duties of the instructors will be as under:—

(*a*) *Director.*—(1) To conduct the course, attend to the good instruction of the staff and the correct service of the school.

(2) To propose to the Maritime Territory Direction the appointment of those operators who have passed the final examination of the course.

(3) To propose to the above-named authority any reforms to the regulations which he deems necessary as also to the syllabus for examinations, and time tables of the classes.

(4) To preside at all examination meetings.

(5) To keep the statistics of the course, and send a monthly report showing its actual working to the Maritime Territory Direction.

(6) To share, when it is necessary, the tasks of the instructors, or to assume his post whenever he is obliged to absent himself.

(*b*) *Electricity and Radiotelegraphy Instructor.*—(1) To have under his personal charge the theoretical and practical instruction in the subjects of electricity and radiotelegraphy, in conformity with the syllabus given in the present regulations.

(2) To keep the book of the daily attendance of the pupils.

(3) To keep notes of the conduct and advancement of the pupils in the subject which he teaches.

(4) To propose to the director of the course those reforms, which in his opinion, would improve the syllabus and time tables of the classes.

(*c*) *Morse Instructor.*—(1) Will have under his personal charge the practical instruction of Morse.

(2) To keep the manipulators, vibrators and cells in good working order.

(3) To help the instructor in all experiments.

(4) To keep the book of daily attendance to his classes.

Art. 7.—For the efficient working of the school the following documents and books will be kept:—

(*a*) Investment of money. In this book will be entered in detail, supported by its respective voucher, every expense incurred, either in salaries of the staff or in appliances for the course.

(*b*) Statistics of operators, examinations and titles.

(*c*) General attendance.

(*d*) Notes of conduct and advancement in the various subjects.

(*e*) File of communications sent.

(*f*) File of communications received.

Art. 8.—The duration of the course for operators of the National Mercantile Navy will be as indicated in the table below, *i.e.*, eight months comprising 100 hours of instruction:—

Periods.	Duration in months.	From.	To.
Preparatory	3	1st August ..	31st October
Theoretical	3	1st November	31st January
Practical	2	1st February	1st March

The above periods will be distributed as follows:—

(*a*) *Preparatory.*—This will comprise, in accordance with the syllabus in the appendix, the following subjects:—

Revision of arithmetic, and algebra, electricity and Morse.

At the end of such period, a partial examination will be taken to select those students, who, in the opinion of the teaching staff, have not sufficient knowledge to go on.

(*b*) *Theoretical.*—The subjects dealt with in the previous period (excepting arithmetic and algebra) will here be extended and the

subjects of electricity and radiotelegraphy will be taught.

(*c*) *Practical.*—The teaching of Morse will here be continued, and the students will receive instruction in the practical handling of a radiogram, the practical workshop and regulations.

ART. 9.—As the object of this course is to meet the requirements of the daily life imposed on the students, the classes will be held after working hours, and in accordance with the time table set up by the directing staff.

ART. 10.—The course will have a capacity for 40 students, in order that there are not less than 50 per cent. when the selection is made at the end of the first period.

ART. 11.—Such faults as may be committed by the students will be punished in accordance with their gravity, as follows :—

(*a*) Simple reprimand by the instructor.

(*b*) Severe reprimand by the director, in the presence of the rest of the students.

(*c*) Expelled from the course, which will be decreed by the Maritime Territory Direction, upon the advice of the director of the course.

CHAPTER II.

ADMISSION OF STUDENTS.

ART. 12.—Those candidates who wish to study the Course for operators of the National Mercantile Marine, could present themselves to the examination for admission, on application on sealed paper (in accordance with the Stamp Law) to be addressed to the Maritime Territory Direction in the first fortnight of the month of July, and must fulfil the following requirements :—

(*a*) To be Chilean or nationalised, in compliance with the laws of the Republic.

(*b*) To be of any age between 18 and 30 years, attested by the respective birth certificate.

(*c*) To appear in the Military Register, or to have complied with the Law of Recruits and Deputies, supported by the respective documents.

(*d*) To be healthy and of good constitution consistent with the life on board and that calling.

(*e*) To exhibit proofs of good conduct and character, by means of certificates from the school where educated and from past employers.

(*f*) To have been vaccinated, or to have had smallpox. N.B.—The application must contain the address of the person concerned.

ART. 13.—(*a*) The Maritime Territory Direction will communicate with the applicants, advising their acceptance or rejection, before the 25th July.

(*b*) In such communications the candidates accepted will be told the date, hour and place of examination.

ART. 14.—All candidates will be submitted to an oral or written examination dealing with the following subjects :—

(*a*) *Arithmetic.*—The four simple rules, decimals and fractions, metrical system and some other easy problems in connection with the application of these rules.

(*b*) *Spanish.*—To read and write correctly, and to compose clearly.

(*c*) Any advanced knowledge possessed by the candidate in grammar, electricity, signals, Morse telegraphy and languages, will be recorded.

ART. 15.—The examinations for admission will be carried out by a commission composed of the following persons :—

(*a*) *In Valparaiso.*—The director of the course, the instructor in radiotelegraphy, and the instructor of Morse.

(*b*) *In the naval stations.*—Two officials and one naval operator appointed by the Commander-in-Chief.

ART. 16.—(*a*) The duration of the examination will be that which the commission thinks necessary to give them an idea of the knowledge and aptitudes of the candidate.

(*b*) The marking for the examinations, both written and oral, will be secret, from 0 to 10, 0 signifying "poor," 5 "fair" and 10 "very good."

The intermediary numbers serve for graduating the differences.

(*c*) To pass, the candidate must obtain a sufficient majority of marks.

ART. 17.—The commission will draw up a report of all the proceedings, which will be signed by each one of its members, wherein will be noted :—

(*a*) The candidates presented.

(*b*) The candidates passed, and

(*c*) Those rejected, will take back their papers.

CHAPTER III.

EXAMINATION OF THE STUDENTS.

ART. 18.—(*a*) As laid down in Clause (*a*), Art. 8, of the present regulations, an examination —in the subjects appearing in the first part of each syllabus—for selecting the students, will take place at the end of the first period of instruction.

(*b*) This examination of selection will be performed by the directing staff of the school, and the word "passed" or "rejected" will be sufficient for the student continuing the course or being definitely excluded from it.

(*c*) Immediately the examination is carried out, the director of the course will get into communication with the Maritime Territory Direction.

ART. 19.—(*a*) At the end of the third period, the final examinations, both written and oral, will take place, of which function the Maritime Territory Direction will be informed by the director of the course.

(*b*) The Maritime Territory Direction will fix the date for the examination, appointing such delegate as he esteems best, for him to be present at the said examination and to sign the proceedings.

ART. 20.—(*a*) This will be composed of, besides the delegate, the members appearing in Clause (*a*), Art. 15, of the present Regulations.

(*b*) The marking will be governed by that laid down in Clauses (*b*) and (*c*), Art. 16, of the present Regulations.

(*c*) The acts of the examinations will be drawn up in accordance with Art. 15 of the present Regulations.

ART. 21.—The duration of the final examinations will be at least that which is given below :—

(*a*) For electricity : 20 minutes.

(*b*) For radiotelegraphy : 30 minutes.

(*c*) For Morse : 15 minutes.

ART. 22.—As soon as the examinations are finished, the results will be communicated to the Maritime Territory Board by the director of the course, who will enclose a copy of the proceedings with the order of merit of the examinees.

ART. 23.—(*a*) With the results of the examination before him, the Maritime Territory Director will issue the titles of Second Class Operators to the students approved, fixing the order of priority according to the average note.

(*b*) Such priority is established as an appreciation of the capacity of the operators.

CHAPTER IV.

EXAMINATION FOR SECOND AND FIRST CLASS OPERATORS.

ART. 24.—Every person who, without having gone through the course laid down in these Regulations, wishes to secure a post of Second Class Operator in the Mercantile Navy, should apply to that effect to the Mercantile Territory Director, requesting that such appointment be granted to him by the commission of examinations concerned.

The applicant must fulfil the conditions laid down in Clauses (*a*), (*b*), (*c*), (*d*), (*e*) and (*f*) of Art. 12., Chapter II of the present Regulations.

ART. 25.—(*a*) The Maritime Territory Director will supply the application form, and with it, if the decision is favourable to the applicant, call a meeting of the commission of examinations, which, if there is no school, will be composed of the radiotelegraphy inspectors, his assistant and an operator.

(*b*) The subjects to be dealt with in the examination will be those given in the syllabuses of the present Regulations.

(*c*) The marking and other processes will be the same as those laid down in Arts. 14 and 15 of the present Regulations.

(*d*) The candidates passed in this examination will receive from the Maritime Territory Direction the title of Second Class Operators.

Art. 26.—Second Class Operators can be promoted to First Class Operator, if they are able to comply with the following requirements :—

(*a*) Two years at least at sea, having served actively in radiotelegraphic stations on board a ship. This time to be supported by certificates on official lines written out by the commanders under whom served.

(*b*) To have observed good conduct, and fulfilled technical obligations.

(*c*) To address an application to the Maritime Territory Director, requesting an appointment by the commission concerned.

The applicant to be able to fulfil the requisites enunciated in Clauses (*a*), (*b*), (*c*), (*d*),(*e*) and (*f*) of Art. 11, Chapter II, of the present Regulations.

ART. 27.—(*a*) The conditions of the examination will be the same as those laid down in Art. 24, Clauses (*a*), (*b*) and (*c*), except that the candidate will be required to be able to do a speed of 20 words per minute in the transmission and reception of messages, reckoned up at the rate of five letters to a word.

(*b*) The candidates passed in this examination will obtain from the Maritime Territory Director the appointment of First Class Operators.

ART. 28.—All operators' titles will be valid for five years, these being withdrawn if the person concerned fails to comply with the requirements set out as under :—

ART. 29.—The operators' titles in the Mercantile Navy will be withdrawn if the operators during two years have not served as such for six months at least.

ART. 30.—Similarly, the operator might be suspended temporarily, or his title be definitely withdrawn from him by the authority who gave it to him, who is suffering from ear troubles, or condemned for guiltiness or negligence, asserted by competent persons, or to whom it is proved, by opening an inquiry, deficient professional preparation, dishonesty, drunkenness, immorality, or other serious delinquencies.

CHAPTER V.

REPETITION COURSES AND REQUALIFYING FOR TITLES.

ART. 31.—Subject to the sanction of the Maritime Territory Director who forms part of the course for refreshing the knowledge of the students, the persons named in the preceding article, who should consider themselves going through a course of repetition, will be admitted to the operators school.

ART. 32.—The course of repetition may be composed of the following persons :—

(*a*) Retired operators from the Navy who apply to that effect.

(*b*) Mercantile operators who, having given up, temporarily, their profession, wish to renew their knowledge to return to it.

(*c*) All operators in active service who, having the necessary time to spare, so desire.

ART. 33.—The conditions for the repetition course will be the same as those set up in Chapter III of the present regulations for school members.

ART. 34.—Every operator wishing to requalify for the title, owing to its validity having expired, must pass in the same manner and under the same conditions as the school members, the examinations prescribed in the present regulations.

APPENDIX.

SYLLABUS OF ORAL AND WRITTEN EXAMINATIONS.

1.—ARITHMETIC.

First Period.

(*a*) The four simple rules, fractions and decimals.

(*b*) Problems in connection with the four simple rules.

(*c*) Weights and measures, metrical system.

(*d*) Problems on the metrical system.

2.—ALGEBRA.

First Period.

(*a*) Elementary rudiments, notations, signs, negative quantities.

(*b*) Addition, reduction of similar terms, negative quantities, unknown quantities.

3.—MORSE.

(*a*) Characteristics and signs.

(*b*) Practice in transmission and reception until at the end of the first period a speed of not less than 10 words per minute is reached, and at the end of the course, more than 12 words per minute. The number of words to be computed at the rate of five letters to a word.

To obtain the title of first class operator, the speed in transmitting and receiving must not be under 12 words per minute.

4.—ELECTRICITY.

First Period.

(*a*) Static electricity. Electric charges. Electrical field. Conducting and insulating bodies. Unit of quantity of electricity; the Coulomb. Electric potential. Electrical capacity; the Farad. Electric condensers. Discharge of the condensers. Coupling of condensers.

(*b*) Electrodynamics. Electric current. The ampere. Switches. Electrical resistance. The Ohm. Ohm's law. Simple problems of Ohm's law.

(*c*) Electrical cells. Electrodes. Characteristics

of cells. Coupling of cells. Polarisation of cells. Depolariser.

(d) Electric accumulators. Electrodes, electrolyte. Process; its density. Modern accumulators. Charging and discharging process. Charge and discharge voltage. Capacity of an accumulator. Slight idea on the alkaline accumulator.

(e) Magnetism. Magnets. Magnetical induction. Magnetic and diamagnetic bodies. Magnetic field. Magnet making. Magnetic compass.

Second Period.

(a) Electromagnetism. Diversion of the magnetic compass by electric current. Right-hand rule or amperes. Induction of solenoid coil. Electromagnet. Galvanometers. Ampermeters. Voltmeters.

(b) Electromagnetic induction. Dynamos. Working of a dynamo. Inductors. Induction. Commutators and its brushes. Double and multipole dynamos. Series shunt and compound dynamos. Characteristic of dynamos. Sketch representing the dynamos. Installation of dynamos on board. Distribution board of the dynamos. Keys. Fuses. Lamps.

(c) Electric motors. Working. Counter E.M.F. Starter and field regulators. Sketch. Series, shunt and compound motors. Care and handling of motors. Generating motor of a wireless station.

(d) Working. Power. The watt: unit of power. The Joule; working unit. Horse power; unit of mechanical power.

(e) Transformers. Fixed and rotating transformers. Rule of transformation. Ruhmkoff's coil. Electric bells. Telephones.

(f) Inductance. Self-induction, or phenomena due to induction.

(g) Alternators. Frequency of alternating current. Currents of low frequency, high frequency and oscillatory current. Resonance and its object.

(h) Knowledge of electric conductors with and without insolation and their characteristics according to the S.W.G., and of the lead fuses in accordance with their diameter.

5.—Radiotelegraphy.

Second Period.

(a) Condenser. Oscillating discharge of the condenser. Oscillating circuit. Oscillators used in radiotelgraphy.

(b) Open oscillating circuit or aerial. Radiation and propagation of the electromagnetic wave into space. Velocity of the electromagnetic wave. Wavelength. Damp and continuous waves. Decrement allowed.

(c) How the signals emitted by a transmitting station are received.

How the electromagnetic waves in the transmitting station are produced.

Wavelengths employed on steamer and coast stations.

Third Period.

(a) Circuit and general working of a radiotelegraphic station.

(b) Description of the continuous current circuit in the Valparaiso radiotelegraph station. Circuit of alternating current in the same station. Circuit of low frequency and high tension alternating current. Oscillating circuit and aerial circuit.

(c) Reception circuit. Idea of the magnetic detector and multiple tuner. Crystal detectors, and crystals used. Modern receivers. Idea of amplifiers.

(d) Handling and practical working of the transmitting and receiving apparatus.

(e) Main difference with other types of wireless sets.

(f) Preservation of the apparatus and testing.

(g) Practice in the workshop.

(h) Knowledge of the regulations.

REPUBLIC OF CHILE.

National Navy.

Regulations for Private, Amateur and Practical Radiotelegraph Stations.

Art. 1.—In accordance with Art. 1 of the Regulations of the Radiotelegraphic Service of the Navy, approved by Supreme Decree No. 164, dated 28th February, 1921, the Government will grant permission for the installation of private radiotelegraphic stations, exclusively destined to studies and experiments, provided that the stipulations of the present Regulations are adhered to.

Art. 2.—The power of the station not to be greater than 50 watts, measured at the terminals of the generator.

When oscillation (transmitting) valve is employed the power can be reduced, according to the requirements of the Radiotelegraphic Service.

Art. 3.—Any system of transmitter can be used, except that of direct coupling from the aerial to the oscillator.

Art. 4.—The maximum height and length of the conductor of an aerial will be 30 metres.

When two or more conductors are used, the height and length will be limited to 20 metres.

The length of the aerial will be measured from the leading-in insulator to its extremity.

Art. 5.—The longest wavelength that can be used in the transmission will be 200 metres.

The coupling between the primary and secondary of the transmitters will be such, that the two waves produced by the aerial do not differ more than 10 per cent from the longest.

Art. 6.—The logarithmic decrement of the oscillation of the transmitting aerial must not be greater than 0·2.

Art. 7.—Private stations possessing transmitters, must not be set up nearer than three kilometres from the Government stations.

When a new Government station is established, licenses to amateurs having their transmitting installations within a radius of three kilometres from the new station, will be cancelled.

Art. 8.—The person who desires to instal a private station, should apply to the Ministry of the Navy, requesting the corresponding license.

Such application will be handed to the Maritime Territory Director to be forwarded, and through the intermediary of the General Direction of the Navy, to the Ministry of the Navy.

In this application the person concerned will state, besides his name, his father and mother's surnames, nationality, age, profession, address, the locality in which he desires to instal his station, and a detailed description of the installation, showing specially the type, power, aerial and purpose of the installation.

Art. 9.—On the receipt of such application the Maritime Territory Direction will, for its information, make sure of the following:—

(a) That the applicant has sufficient knowledge to handle his installation, and that he is capable of transmitting and receiving at least 10 words per minute.

(b) That the position proposed for the station complies with the requirements of the Regulations.

(*c*) That the system, power, aerial, etc., complies with the requirements laid down in the present Regulations.

(*d*) That the applicant is in the position to prove his identity by means of his identity certificate.

On registering this application it will also be designated with a corresponding number or mark.

ART. 10—On the Minister of the Navy granting this license. the Maritime Territory Director will send it to the Maritime Authority nearest to the place of the installation, in order to be handed to the person concerned.

On the Maritime Authority handing the applicant the license, the former will urge him to declare when he will start and finish his installation.

The license will hold good for the term of five years, at the end of which the applicant, if he so desires, will apply for an extension for another similar period.

ART. 11—On receipt of the license from the Maritime Authority the applicant must, under oath, undertake not to divulge the communications which he intercepts, and to use his installation solely for study and experiments, unless the empowered authority should urge him to disclose such communications as he intercepts, or to use the installation for other ends; or that the communications intercepted are of such a nature as to justify their being communicated to some authority in order to avoid misfortunes or other evils; or in the case of news of general interest, such as press or others of the kind.

The Maritime Authority will take down this oath declaration in writing and send it on to the Maritime Territory Direction.

ART. 12.—Once the installation is completed the Maritime Authority will inspect it and make sure that it complies with the requirements herein laid down, and if so, will authorise the working of the station.

He will give an account of all this to the Maritime Territory Director.

ART. 13.—Once the amateur is authorised to work the installation, he must not make any modifications implying changes neither in the power nor in the system of emission, without previous authorisation from the Maritime Territory Director.

ART. 14.—The granted license only authorises its proprietor to operate with the transmitter of his installation.

ART. 15.—Private stations are subject to the inspections which may be ordered by the Maritime Territory Director.

ART. 16.—They are under the obligation of obeying the immediate orders issued by the stations of the Navy.

ART. 17.—All private stations are, as from the time they receive their license, subject to the International Regulations and those of the Navy, and to the subsequent measures which the Government at any time might deem desirable to dictate.

ART. 18.—In the event of any breach in the Regulations, the Maritime Territory Director might order the closing up of a private installation and take the necessary steps to carry this into effect.

In such cases the Maritime Territory Director will inform his superiors, so that the cancellation of the corresponding license may be granted by the Supreme Governemnt.

ART. 19.—Concessions for the establishment of private stations will be considered as cancelled with the promulgation of the decrees ordering the partial or total mobilisation of either the Army or the Navy; in that event the Maritime Authorities who have issued the licenses for the installation, will proceed without further steps to dismantle those stations, the apparatus of which to be placed under their custody or, if necessary, requisitioned and note of the proceedings to be taken in writing.

ART. 20.—The term "radiotelegraphic station" used in the present regulations applies not only to the installations completed, but also to those exclusively designed for receiving and transmitting, whether for radiotelegraphy or radiotelephony.

CHATHAM ISLANDS

(See NEW ZEALAND.)

CHINA

(1) FOREIGN SETTLEMENTS.

(*For Laws of the Republic see under "Chinese Republic," page* 231.)

(A) Hong-Kong.

THE Crown Colony of Hong-Kong consists of a number of islands situated off the south-eastern coast of China, at the mouth of the Canton River, and of a portion of the adjacent mainland. They lie between latitude 22° 10′ and 22° 34′ N.; whilst the longitude extends between 113° 52′ and 114° 30′ E. The capital of the Colony is Victoria, built on the northern shore of Hong-Kong Island, facing the mainland. The magnificent harbour consists of the arm of the sea which lies between the mainland and the city. It was first occupied by Great Britain in January, 1841, and is now administered as a Crown Colony under a Governor aided by an Executive Council of nine members and a Legislative Council of thirteen.

CONTROL AND ORGANISATION.

Hong-Kong possesses two wireless stations, one of which, at Cape D'Aguilar, is for commercial service. This station is worked by the Hong-Kong Post Office and under the control of the Colonial Postmaster-General.

Weather reports are broadcasted twice daily at 0500 G.M.T.* and 0900 G.M.T. on 600 metre wavelength.

Typhoon warnings are broadcasted on receipt from the Royal Observatory and repeated at each even hour until midnight on 600 metre wavelength. Both of these signals are transmitted by Cape D'Aguilar.

Time Signals are broadcasted twice daily at 0200 G.M.T. and 1300 G.M.T. on a 2,000 metre wavelength by Stonecutters W/T Station.

A Direction Finding Apparatus will be installed in the near future at Cape D'Aguilar.

A new sub-station is under construction at Gap Rock to ensure communication between the Gap Rock Signal Station and Hong-Kong. The installation is 1/2 kw., Marconi type.

*Note.—(Hong-Kong time is eight hours ahead of G.M.T.)

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. M. J. Breen	Postmaster-General	Hong-Kong
Mr. S. Bradshaw	Superintendent Wireless Telegraphy.. ..	Hong-Kong

ADMINISTRATION.

The regulation of wireless telegraphy is carried on under the provisions of the Wireless Telegraphy Ordinance, 1913, passed on July 24th of that year, which repealed all previous Ordinances; and by regulations issued under that Ordinance.

A—The Wireless Telegraphy Ordinance, 1913.
B—Regulations.
C—Ship License.
D—Permit to use wireless telegraphy on ships in the harbours of the Colony.

ORDINANCE No. 20 OF 1913.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. "Telegraph" means an electric, galvanic or magnetic telegraph and includes appliances and apparatus for transmitting or making telegraphic, telephonic or other communications by means of electricity, galvanism or magnetism.

The expression "Wireless Telegraphy" means any system of communication by "telegraph" as (defined in this Ordinance) without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: provided that nothing in this Ordinance shall prevent any person from making or using an electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

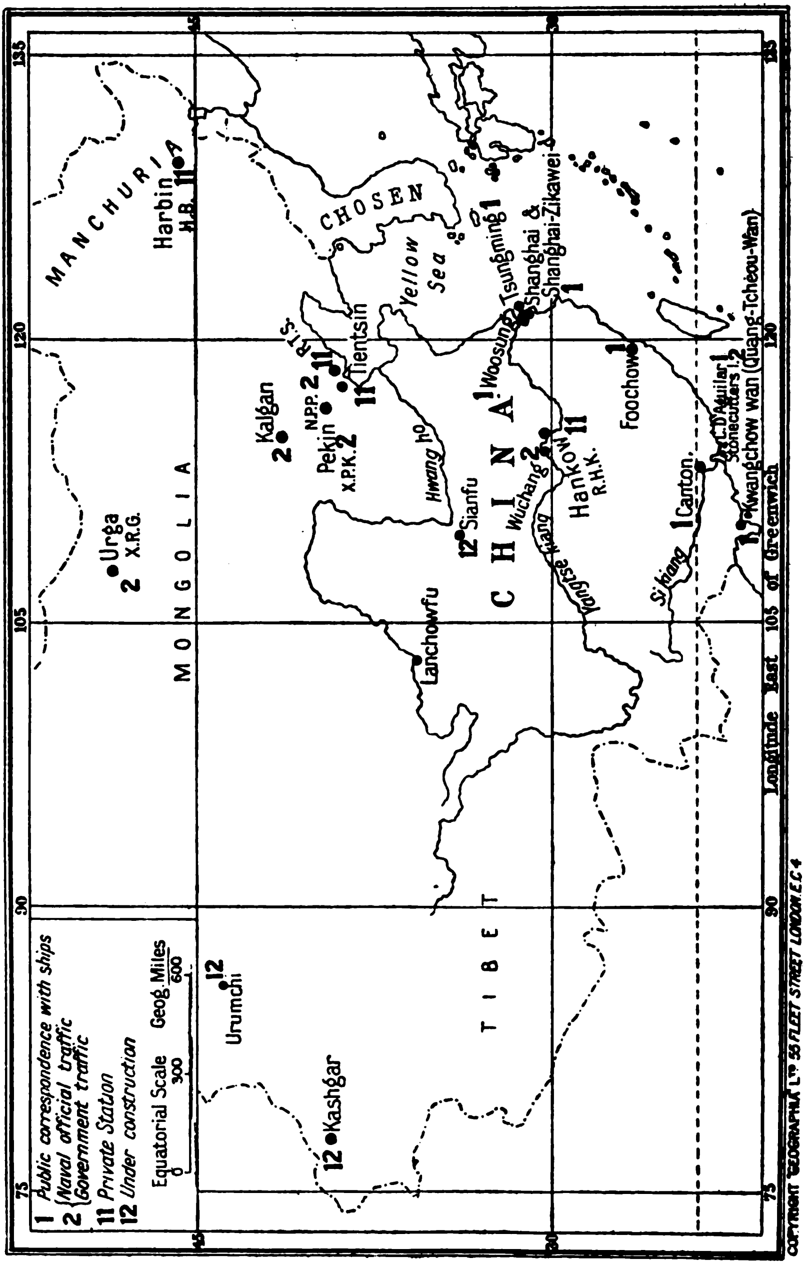
3. The Governor may whenever he shall deem it expedient to do so license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the colony or on board any British ship registered in the colony.

(4). (i) No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place in the colony or on board any British ship registered in the colony except under and in accordance with a license granted in that behalf by the Governor.

(ii) Every such license shall be in such form and for such period as the Governor-in-Council may determine and shall contain such terms, conditions, and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

5. (i) If any person establishes a wireless telegraph station without a license in that behalf or instals or works any apparatus for wireless telegraphy without a license in that behalf he shall be liable to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Attorney-General.

(ii) If a magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize


1 Public correspondence with ships
2 Naval official traffic
Government traffic
11 Private Station
12 Under construction
Equatorial Scale
Geog. Miles
0
300
600
MANCHURIA
Harbin
H.B.
CHOSEN
Yellow Sea
Tsungming
Shanghai & Shanghai-Zikawei
Woosung
Tientsin
R.T.S.
N.P.P.
Pekin
X.P.K.
Kalgan
Urga
X.R.G.
MONGOLIA
CHINA
Hwang ho
Sianfu
Wuchang
Hankow
R.H.K.
Foochow
Yangtse Kiang
Si kiang
Canton
C. D'Aguilar
Stonecutters I.
Kwangchow wan (Quang-Tchéou-Wan)
Lanchowfu
TIBET
Urumchi
Kashgar
Longitude East 105 of Greenwich
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any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (i) The Governor-in-Council may make regulations for all or any of the following matters:—

(*a*) For prescribing the form and manner in which applications for licenses under this Ordinance are to be made;

(*b*) For prescribing the fees payable on the grant of any license;

(*c*) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the colony shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in the colony or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(*d*) For prohibiting, except with the special or general permission of the Colonial Secretary, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the colony;

(*e*) For prohibiting or regulating, in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the colony, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(ii) Provided that no regulations made in respect of the matters described in paragraphs (*c*), (*d*), and (*e*) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the Governor that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy a license for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

8. (i) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulation made thereunder or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine of five hundred dollars.

(ii) All convictions, forfeitures, and fines under this Ordinance or any regulations made thereunder may be had and recovered before a magistrate.

9. The Wireless Telegraphy Ordinance, 1903, the Wireless Telegraphy Ordinance, 1909, and the Wireless Telegraphy Amendment Ordinance, 1909, are hereby repealed.

B The following regulations were made by the Officer Administering the Government in Council under the provisions of Section 6 of the Wireless Telegraphy Ordinance No. 20 of 1913, on November 20th, 1913:—

1. Any person desirous of obtaining a license for the establishment of a wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the colony, or on board any British ship registered in the colony, must apply in writing to the Colonial Secretary. Such application must contain full particulars—

(*a*) of the place or ship in respect of which a license is sought;

(*b*) of the nature of the apparatus which it is desired and proposed to instal and work; and

(*c*) of the purposes for which the installation is intended to be utilised.

2. The following shall be the fees payable on the grant of licenses:—

(*a*) For a license under Section 3 for a land station $2.50

(*b*) For a license under Section 3 for a ship station $2.50

(*c*) For an experimental license under Section 7.. .. .. .. Nil

3. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the colony shall be worked in such a way as not to interfere with—

(*a*) Naval signalling; or

(*b*) The working of any wireless telegraph station lawfully established, installed, or worked in the colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the colony except with the special or general permission in writing of the Colonial Secretary of the colony.

5. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that his Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. No proceedings shall be taken against any person under these Regulations except with the previous sanction of the Attorney-General.

SHIP LICENSE.

Dated the day of , 19 .

C THE WIRELESS TELEGRAPHY ORDINANCE, 1913.
(HONG-KONG.)

His Excellency the Governor of the Colony of Hong-Kong
To....................................

License to establish Wireless Telegraph Ship Stations.

To ALL TO WHOM THESE PRESENTS SHALL COME I..................................
....
Governor and Commander-in-Chief of the Colony of Hong-Kong and its Dependencies and Vice-Admiral of the same send greeting:

Whereas ....
of ....
(hereinafter called "the licensee") is desirous of establishing installing working and using on a ship or ships belonging to the licensee Wireless Telegraphy as defined in Section 2 of the Wireless Telegraphy Ordinance, 1913:

And whereas by reason of the provisions of the Wireless Telegraphy Ordinance, 1913, it is unlawful to establish any wireless telegraphy station or instal or work any apparatus for wireless telegraphy in any place in the colony or on board any British ship registered in the colony except under and in accordance with a license granted in that behalf by the Governor:

And whereas at the request of the licensee I have agreed to grant to the licensee the licenses powers and authorities hereinafter expressed and contained for the period upon the terms and subject to the stipulations and conditions hereinafter appearing:

Now I the above-named..................
....
Governor and Commander-in-Chief of the Colony of Hong-Kong and its Dependencies and Vice-Admiral of the same in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee from the date hereof so long as the Wireless Telegraphy Ordinance, 1913, shall continue in force unless and until these presents and the license or permission hereby given shall be determined as hereinafter provided license and permission—

(i) To establish, instal and work for the purposes hereinafter mentioned at the ship station or stations specified in the Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedule hereto (which apparatus is hereinafter referred to as "the licensed apparatus"):

Provided that—

(*a*) Each ship station shall be of such class mentioned in Article XIII of the Service Regulations annexed to the Radiotelegraphic Convention, 1912, as is specified in the said Schedule opposite to the name of such station;

(*b*) The apparatus installed at each ship station shall be of the character specified in the said schedule opposite to the name of such station;

(*c*) The sending apparatus used at each ship station shall be of such a character that the waves emitted are as pure and as little damped as possible and the receiving apparatus used at the said station or stations shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals;

(*d*) The apparatus shall include such emergency installation as may be required according to the class of the ship station under the provisions of Article XI of the Service Regulations annexed to the Radiotelegraphic Convention, 1912;

(*e*) The licensed apparatus shall be so constructed as to be capable of using wavelengths of 600 and 300 metres in length as measured by the standard of measurement in use by the Government of the Colony for the time being or as may be otherwise directed by the Governor and such other wavelengths not exceeding 600 metres in length as shall be authorised in writing from time to time by the Governor; Provided always that the wavelength of 600 metres shall normally be used for communication and further that the wavelength of 1,800 metres may be used in the exceptional case contemplated by Article XXXV (2) (*a*) of the Service Regulations annexed to the Radiotelegraphic Convention, 1912; Provided further that only the wavelength of 600 metres shall be used by the licensee during the period of any war in which the United Kingdom is engaged;

(*f*) The apparatus shall admit of the transmission and reception of messages at the rate of not less than 20 words a minute five letters being counted as one word.

(ii) To send and receive messages by means of the licensed apparatus between the said ship stations and also between the said ship stations and coast stations and other ship stations.

Provided that the licensee shall not except with the consent in writing of the Colonial Secretary of the Colony send or receive messages from and at the said ship stations when in any of the harbours of the colony; and

(iii) To receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there shall be something either in the subject or context repugnant to such construction (that is to say):—

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The term "telegraph" has the same meaning as in the Wireless Telegraphy Ordinance, 1913.

The expression "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether a coast station or a ship station.

The expression "the Admiralty" means the officer of His Majesty's Navy who is for the time being in Hong-Kong in charge of the China Squadron of His Majesty's Eastern Fleet.

The expressions "the International Telegraph Convention" and "the International Telegraph Regulations" mean respectively the International Convention of St. Petersburg, dated the 10th/22nd July, 1875, and the Service Regulations made thereunder and include

respectively any modifications of the Convention or regulations made from time to time.

The expression "the Radiotelegraphic Convention, 1912," means the Convention signed at London on the 5th day of July, 1912, and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which has been established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf of or by permission of the licensee for the transmission or receipt of messages except messages authorised by this license.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling.

(2) If the Admiralty is of opinion that the working of the licensed apparatus at any ship station specified in the Schedule hereto is inconsistent with the free use of Naval signalling the licensee shall when required in writing by the Governor so to do close the said station.

(3) These provisions for the protection of Naval signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

4. For the purpose of this license the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Wireless Telegraphy Ordinance, 1913, by the Governor-in-Council in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraphic Convention, 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Governor from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not without the consent of the Governor be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

9. The licensee shall at all times indemnify the Governor against all actions claims and demands which may be brought or made by any corporation company or person in respect of any injury arising from any act licensed or permitted by these presents.

10. (1) Subject to the provisions of this license the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge, order of transmission or otherwise. Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be govened by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

11. The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

12. (1) The licensed apparatus at each of the ship stations mentioned in the Schedule hereto shall be worked only by operators holding certificates issued by the Governor or the Postmaster-General of the United Kingdom or the Government of any self-governing Dominion and the licensee shall provide for the working of each station such operators as are required by the provisions of Article X of the Service Regulations annexed to the Radiotelegraphic Convention, 1912, according to the class of the ship station and shall observe the regulations as to the working of the ship station laid down according to its class by Article XIII of the said Regulations.

(2) A certificate shall not be recognised as authorising the holder to work a ship station under the terms of this license unless it bears a statement that it is issued by the Governor or the Postmaster-General of the United Kingdom or the Government of any self-governing Dominion in accordance with the Radiotelegraphic Convention, 1912. Such certificates will be valid only during the operation of the said Convention. When issued by the Governor such certificates will be granted to persons of such technical proficiency and will be in such form and will be subject to such conditions as the Governor shall from time to time prescribe and they may be, by whomsoever issued, endorsed or withdrawn at the discretion of the Governor in case of misconduct or breach on the part of the holder of the regulations prescribed for the working of ship stations.

13. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the ship stations specified in the Schedule hereto a copy of Section 11 of the Post Office (Protection) Act, 1884, and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of this license entitling the Governor under clause 22 hereof to revoke and determine this license.

14. The licensee shall keep full accounts records and registers of all messages transmitted by means of the licensed apparatus and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination and such further particulars as the Governor shall from time to time reasonably require to be shown; messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms

written and printed and transcripts of messages and all other papers for a period of at least fifteen months counting from the month following that in which the radiotelegrams were handed in as prescribed by the Radiotelegraphic Convention, 1912, and such registers and message papers shall be open to the inspection of the Governor or his officers thereto authorised at the office of the licensee in Hong-Kong or at such other place as may be agreed between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a general or public holiday.

15. The licensee shall render to the Governor such accounts as the Governor shall direct in respect of all charges, if any, due or payable under the Radiotelegraphic Convention, 1912, in respect of messages exchanged between the ship stations hereby licensed and coast stations and shall pay to the Colonial Treasurer at such times and in such manner as the Governor shall direct all sums which shall be due from the licensee under such accounts.

16. The Governor and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the ship stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instrument respectively.

17. The licensee shall carry on every ship on which a ship station is established under this license a print or copy of the license certified under the hand of the Colonial Secretary of the colony of Hong-Kong or appropriate officer of the Postmaster General of the United Kingdom or of the Government of any self-governing Dominion to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls. The licensee shall also carry on every such ship such documents as may be prescribed by the Governor for the purpose of enabling the licensee to communicate with coast stations and ship stations in accordance with the Radiotelegraphic Convention, 1912.

18. (1) The licensee shall pay to the Colonial Treasurer for and in respect of the license hereby granted a royalty of $2.50 per annum in respect of each ship station at which the licensed apparatus is installed.

(2) The said royalty shall be payable on the 1st of December in each year during which the license remains valid.

19. Except with the consent in writing of the Governor the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licenses, powers or authorities hereby granted or any of such licenses, powers or authorities.

20. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval, Military, Customs or Police officer or any other person authorised by the Admiralty to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any officer or person so authorised may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent the use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised may in such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may enter upon any ship on which any apparatus is installed accordingly or the said officer or person so authorised may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

21. At any time after the   day of   , 19   , the Governor may in his absolute discretion give notice in writing to determine these presents and the license or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Governor under any condition or provision herein contained.

22. In any of the following cases (that is to say): —

(a) In case any sum of money which ought to be paid by the licensee to the Colonial Treasurer under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained; then and in any such case the Governor may by notice in writing under his seal revoke and determine these presents and the licenses, powers and authorities hereinbefore granted and each and every of them as to all or any of the ship stations hereby licensed and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said ship stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Governor under any condition or provision herein contained.

23. Nothing in these presents contained shall prejudice or affect the right of the Governor from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the

right of the Governor from time to time to enter into agreements for or to grant licenses relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the colony by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Governor or any other person by or under any Imperial or local enactment or by or under any agreement relating to the transmission of messages by ordinary land and submarine telegraphy.

24. Any notice request or consent (whether expressed in writing or not) to be given by the Governor under these presents may be under the hand of the Colonial Secretary of the Colony of Hong-Kong and may be served by sending the same in a registered letter addressed to the licensee at the usual or last known place of residence or business of the licensee or if such notice request or consent relates to any particular ship station by delivery to the master of the ship upon which such station is installed and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Colonial Secretary of the Colony of Hong Kong.

As witness my hand and seal this
day of one thousand
nine hundred and

THE SCHEDULE OF SHIP STATIONS BEFORE REFERRED TO.

Name of Ship on which Station established.	Class of Ship Station under the Radiotelegraphic Convention, 1912.	Nature of Services Performed.	Hours of Service.	Normal Range of Signalling in Nautical Miles.		Character of Apparatus.		Power.		If Alternator is used, Number of Cycles per Second.
				By Night.	By Day.	System of Radio-telegraphy with the Characteristics of the System of Emission.	Wave-lengths (in Metres).	Source and Maximum Output.	Maximum to be taken in Sending Instruments.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

PERMIT TO WORK AND USE APPARATUS FOR WIRELESS TELEGRAPHY ON BOARD A MERCHANT SHIP IN THE HARBOURS OF THE COLONY.

The Wireless Telegraphy Ordinance, 1913.

Section 6 (1) (*iv*).

D Permission is hereby given for the working and using of apparatus for Wireless Telegraphy on board the ships of the specified in the Schedule hereto whilst such ships are in any of the harbours of the Colony subject nevertheless to the following conditions, namely:—

CONDITIONS.

1. This Permit may be cancelled or suspended at any time by the Governor in his absolute discretion and without any reason being assigned therefor.

2. All such vessels shall obey promptly the "Naval Silence Sign"(▬ ● ● ▬ ● ● ▬ ● ● ▬) and thereupon shall not work or use their wireless telegraphy apparatus until after the "Message Complete Sign" (● ● ● ▬ ● ▬) shall have been made.

3. The above company shall render every assistance possible as required by the Postmaster-General by furnishing information in respect of incoming mails carried by the ships of the said company.

4. All information received as to the weather being experienced by the vessels of the said company at sea must be forwarded to the Harbour Office for transmission to the Observatory or sent to the Observatory direct whichever may be the more expeditious. The information should give the date and time of the observation, the position of the ship, the reading of the barometer, the direction and force of the wind, and the state of the sea and weather.

Dated at Hong-Kong, this
day of 19 .
Fee $2 received.

Colonial Secretary.

SCHEDULE.

Colonial Secretary.

(B) Weihaiwei.

WEIHAIWEI, a territory in the Shantung district of China, leased by that Republic to Great Britian in 1898, lies in latitude 37° 30′ N. and longitude 121° 40′ E. The total area comprises 285 square miles.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Sir J. H. Stewart Lockhart, K.C.M.G.	Commissioner of Weihaiwei ..	Government House, Port Edward, Weihaiwei.
Mr. A. P. Blunt	Senior District Officer ..	Government Offices, Port Edward, Weihaiwei.

ADMINISTRATION.

Wireless Telegraphy in the territory is governed by:

A—Ordinance No. 5 of 1913.

AN ORDINANCE TO PROVIDE FOR THE REGULATION OF WIRELESS TELEGRAPHY.

L.S. August 11th, 1913.

BE IT ENACTED by the Commissioner of Weihaiwei as follows :—

1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. "Telegraph" means an electric, galvanic or magnetic telegraph, and includes appliances and apparatus for transmitting or making telegraphic, telephonic or other communications by means of electricity, galvanism, or magnetism.

The expression "Wireless Telegraphy" means any system of communication by "telegraph" (as defined in this Ordinance) without the aid of any wire connecting the points from and at which the messages or other communications are sent and received: provided that nothing in this Ordinance shall prevent any person from making or using an electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Commissioner may whenever he shall deem it expedient to do so license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the territory or on board any British ship registered in the territory.

4. (i) No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place in the territory or on board any British ship registered in the territory except under and in accordance with a license granted in that behalf by the Commissioner.

(ii) Every such license shall be in such form and for such period as the Commissioner may determine and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Commissioner shall consider desirable in the public interest.

5. (i) If any person establishes a wireless telegraph station without a license in that behalf or instals or works any apparatus for wireless telegraphy without a license in that behalf he shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Commissioner.

(ii) If a magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Commissioner may make regulations for all or any of the following matters :—

(i) For prescribing the form and manner in which applications for licenses under this Ordinance are to be made;

(ii) For prescribing the fees payable on the grant of any license;

(iii) For regulating the manner in which apparatus for wireless telegraphy on board a merchant ship whether British or foreign in the waters of the territory shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the territory or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) For prohibiting except with the special or general permission of the Commissioner the working or using of any apparatus for wireless telegraphy on board a merchant ship whether British or foreign whilst such ship is in any of the harbours of the territory;

(v) For prohibiting or regulating in case at any time in the opinion of the Commissioner an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships whether British or foreign in the waters of the territory

the use of wireless telegraphy on board such ships while in such waters by such further rules as the Commissioner may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraphs (iii), (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the Commissioner that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy a license for that purpose shall be granted subject to such special terms, conditions and restrictions as the Commissioner may think proper, but shall not be subject to any rent or royalty.

8. (i) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine of five hundred dollars.

(ii) All convictions, forfeitures and fines under this Ordinance or any regulations made thereunder may be had and recovered before a magistrate.

9. Ordinance No. 1 of 1904 to regulate the establishment of wireless electric telegraphs is hereby repealed.

(2) CHINESE REPUBLIC.

THE Republic of China comprises China Proper (eighteen provinces), Manchuria, Mongolia, Sinkiang, and Tibet. It lies between 18° 13′ and 56° 40′ N. latitude, and between 71° 51′ and 133° 52′ E. longitude. The total area of the eighteen provinces and four dependent territories is estimated at 4,277,170 square miles.

The Republic in its present form was established on October 10th, 1911. The constitution, drafted by the first Parliament, that met on April 8th, 1913, laid down the basis of government under which this great Republic is now governed. The executive power is vested in a President; whilst the legislative authority is exercised by a National Congress, comprising a Senate and a House of Commons.

CONTROL.

Radiotelegraphy in China is owned and controlled by the Government, and its administration is regulated by the Department of Telegraphs, Ministry of Communications. The Ministry of War and the Ministry of Marine control the use of Radiotelegraphy in the Army and the Navy respectively.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
Yeh Kun Cho	Minister of Communications	Peking, Chiaotungpu
Tsiang Tsen Yi	Director General (and Chief of the Department) of Telegraphs, Commissioner of Codification of Telegraphy and Telephony, Ministry of Communications	Peking, Chiaotungpu
Lin Tse Sue	Electrical Engineer, Chief of the Traffic Sub-Department, Department of Telegraphs	Peking, Chiaotungpu
Mr. A. H. Eriksen	Adviser and Foreign Chief Superintendent	Peking, Chiaotungpu
Mr. A. Jörgensen	Wireless Engineer and Instructor in Radiotelegraphy at the College of Post and Telegraphy	Peking, Chiaotungpu
Mr. S. T. Dockray	Wireless Engineer	Peking, Chiaotungpu
Admiral Sah Cheng Ping	Minister of Navy	Peking, Naval Board
Sü Chen Peng	Vice-Minister of Navy	Peking, Naval Board
Chen En Tao	Chief of the Military Department, Naval Board	Peking, Naval Board
General Chin Yuen Peng	Minister of War	Peking, Board of War
Loo Kai Pun	Vice-Minister of War	Peking, Board of War

ORGANISATION.

The coast and inland stations administered by the Ministry of Communications are ten in number, including those of Woosung, Canton, Foochow, Shanghai, Tsungming, Wuchang, Kalgan, and Peking, of which the last five are coast stations open for public service, while the remaining three are official stations. Three new stations of the Marconi type (25 kw.)

are being erected at Kashgar, Tihwafu (Urumtsi), and Urga. One 50 kw. station and five 5 kw. stations will be erected in Yunnan Province. These stations will be of the Poulsen type.

It has been proposed to erect several small stations of from 1½ to 5 kw. in Outer Mongolia and at some important points in Chihli Province.

The Naval Board has purchased a very large station of 500 kw. from a Japanese factory. The erection of this station was started in 1920.

A *Radio Training Station* was opened in Peking in 1913. It is controlled by the Ministry of Communications.

ADMINISTRATION.

At present radiotelegraphy in China awaits development and the laws and regulations affecting the subject consist, therefore, of those formulated to govern the working of the ordinary wired telegraph and telephone applied, as far as they are applicable, to radiotelegraphy. For this reason we present here a translation of the Chinese general regulations affecting all electrical means of communication, with a few comments emphasising the points which appear to affect wireless telegraphy, and also form of license for pilot boats.

A—Instructional Order No. 20.

B—Form of License for Pilot Boats.

INSTRUCTIONAL ORDER No. 20.

A Dated April 18th, in the fourth year of the Republic of China—*i.e.*, 1915. REGULATIONS AFFECTING ELECTRICAL MEANS OF COMMUNICATION.

ART. 1.—All telegraphs and telephones, whether wired or wireless, shall be included in the term "Electrical means of Communication."

ART. 2.—All electrical means of communication shall be owned and controlled by the State.

ART. 3.—The following electrical means of communication may be set up by private individuals or corporations after the sanction of the Government has been obtained:

(*a*) Those established for the exclusive use of railways, mines, or other specific and commercial enterprises.

(*b*) Those which are set up by individuals or corporations or official departments on their premises for the purpose of establishing connection with a public telegraph office for the convenience of the transaction of the business carried on by the said individuals or corporations.

(*c*) Those which are used by individuals, corporations, or official departments for intercommunication between various parts of the building in which they are located.

(*d*) Those which are used by ships *in transitu*.

(*e*) Those which are set up for the purpose of experiment or research.

(*f*) Telephones whose calling powers are to be confined within a certain definite area. These must not, however, be erected in any area which is at present furnished with telephonic communication.

[*This clause appears to be one intended to apply to future telephone installations and not to any which may be at present erected. Of the above items it will be noted only* (*d*) *and* (*e*) *can apply to wireless telegraphy.*]

ART. 4.—The Government, in case of necessity, may, in accordance with the provision of Laws and Edicts, seize all private electrical means of communication and convert them to public or military use. When, under the provision of this regulation, the Government so seize and make use of private owned electrical means of communication, it may appoint officials to take charge of and work them.

ART. 5.—When the Government consider it necessary in the interests and for the maintenance of public safety, they can restrict, suspend or cancel any use of electrical means of communication within certain prescribed areas.

ART. 6.—The Superintendent officials at telegraph offices controlled by the Government may suspend the transmission of any message or refuse altogether to accept it, when they consider its contents to be opposed to public safety.

ART. 7.—When special circumstances or *force majeure* cause telegrams to be delayed in transmission or prevent their transmission, the senders cannot claim compensation for damage arising from such delay or hindrance.

ART. 8.—Correspondents are themselves responsible for the contents of their messages.

ART. 9.—With regard to the transmission of telegrams or telephone messages no exemption with regard to liability or responsibility can be entertained on the ground of mental deficiency on the part of the sender.

ART. 10.—Telegrams received at public telegraph offices—other than those specified by Government orders—will be delivered in accordance with the addresses given by the sender. If, owing to the fact that the address given is incorrect or insufficient, the telegram cannot be delivered, this fact will be publicly announced, and if no application for the message is received within forty-two days from the date of the public announcement, the said message will be destroyed.

ART. 11.—When messages are received in secret code, or in obscure or metaphorical language, the telegraph officials may, if they think fit, call upon the sender to translate the code or elucidate the meaning of the message. If the sender refuses to decode or explain, or, in complying with this request, fail to put the telegraph official truthfully in possession of the real meaning of the message, the official may stop the transmission of the said message.

ART. 12.—Officials, workmen, or messengers engaged in the performance of their duty in connection with telegraphs or telephones are not to be interfered with or stopped by the authorities of the customs or by those operating the canal locks.

ART. 13.—Officials, workmen, or messengers when proceeding in discharge of their official functions are to be allowed unhindered transit over building land and fields (with the exception of those enclosed by walls and gateways) whenever there may be any hindrance to their transit through the regular streets or paths. But if the passage of such officials, workmen, or messengers causes damage to be done to buildings, or to crops in cultivated property, the Government will pay adequate compensation on the application of the owner and on his proof of such damage.

ART. 14.—When officials, workmen or messengers engaged in performing their official functions ask for help or assistance in order to overcome any special hindrance in transit, or when they ask for assistance in climbing mountains or crossing rivers, the persons to whom such request is made may not refuse such help or assistance without assigning adequate reason for so doing. But in the event of such assistance being rendered, the Government will give the person rendering it fit and proper remuneration for such aid and assistance, on his application for such remuneration.

ART. 15.—Telegraph or telephone wires may be set up at convenient places, no matter through what property it is necessary for them to pass; but if their erection involves an encroachment on the rights of others, whether private individuals or corporations, the Government will on application, allot adequate compensation for such encroachment.

ART. 16.—Charges for telegrams and telephone messages shall be collected in cash according to fixed rates.

ART. 17.—Materials used for the purposes of Telegraph and Telephone Services shall be exempted from tax, but not from Customs Duties.

ART. 18.—With reference to the compensation for damage caused, and the right of application for remuneration referred to in the above clauses in connection with the carrying out of Electrical Means of Communication, the period within which such right to compensation or remuneration may be dealt with, and the manner in which it may be so dealt with and adjudicated, shall be regulated by separate "Instructional Orders."

ART. 19.—Any who may offend against Articles 2, 3, 4, 12, 13, and 14, shall be liable to a fine of from 5 to 200 dollars. Those who offend against Articles 2 and 3 shall, in addition to fines, be liable to confiscation of poles, wires, machines or other apparatus.

ART. 20.—The conditions laid down in Articles 12–19 shall not be applicable to private electrical means of communication, but the specially authorised telephones erected under section (*f*) or Article 3 may adopt the regulation comprised in Article 16.

ART. 21.—All Laws, Orders or Treaties affecting telegrams between China and Foreign Countries shall have their respective provisions observed and the provisions of this Instructional Order shall not be held to modify or abrogate them.

ART. 22.—These regulations shall come into force immediately on the date of their promulgation.

FORM OF LICENSE FOR PILOT BOATS IN CHINESE WATERS.

BE The (hereinafter called "the licensee") is hereby granted license to operate within the pilot district of the wireless telegraph system installed on board the Pilot Boat , as specified in the schedule hereto for the period commencing the and terminating on the , on payment of the sum of ten Mexican dollars, being the license fee for the privilege above named.

This license is subject to the following terms, conditions and restrictions :—

1. The licensee shall not establish, instal or operate any apparatus for wireless telegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto.

2. The range of signalling shall at no time exceed one hundred nautical miles.

3. The licensee shall use the licensed apparatus solely for the purpose of exchanging with ships at sea messages relating to the safe and prompt working of the licensee's pilot service, and for making or answering calls of distress. However messages originating or terminating on board the aforesaid pilot boat may be exchanged with the Chinese wireless coast stations at on payment of the ordinary charges accruing to the Chinese Telegraph Administration for wireless messages exchanged by means of the said stations. Payment of such charges shall be made in such manner as the Ministry of Communications shall direct.

4. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the transmission or receipt of messages, except messages authorised under paragraph three.

5. All telegrams exchanged by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose. Such registers as well as the licensed apparatus shall be open to inspection by thereto authorised officers of the Chinese Telegraph Administration.

6. The licensee shall operate the licensed apparatus in accordance with any regulations which may be issued from time to time by the Ministry of Communications.

7. The licensee shall observe the provisions of the International Radiotelegraphic Service Regulations of 1912, as regards transmission of messages (Article XX—Article XXXIV) in so far as they are not inconsistent with the rights and privileges granted by these presents.

8. The licensee shall so operate the licensed apparatus so as not to interfere with :—

(*a*) Naval signalling by means of any system of wireless telegraphy between two or more ships of the Chinese Navy or between a ship of the Chinese Navy and any other wireless station, whether on shore or on any ship ;

(*b*) the working of any wireless telegraph station lawfully established, installed, or worked in China or the territorial waters thereof, and in particular the licensed apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations on ships at sea.

9. The licensee shall not work or use the licensed apparatus whilst the boat is in the harbour of , except with the special permission in writing of the Ministry of Communications.

10. Regulations 8 and 9 shall, however, not apply to the use of the licensed apparatus for the purpose of making or answering signals of distress.

11. The licensed apparatus shall not, without the consent in writing of the Ministry of Communications, be altered or modified in respect of any particulars mentioned in the schedule hereto.

12. The licensee, in case the aforesaid pilot boat be sold or dispensed with and remain in Chinese waters, shall remove the wireless apparatus before transfer of ownership takes place.

13. The licensee shall operate the licensed apparatus only during the hours indicated on the schedule hereto, except for the purpose of making or answering signals of distress.

14. The licensee shall at all times indemnify the Ministry of Communications against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

15. If, and whenever, in the opinion of the Ministry of Communications, the interests of the Government of China demand that the use of the licensed apparatus shall be prohibited or shall be under full control of the said Government, the licensee shall conform to all directions prescribed by the Ministry of Communications.

16. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, the licensee shall be liable for every such breach, non-observance or non-performance to a penalty of one hundred Mexican dollars, and in every such case the Ministry of Communications may, by writing, revoke and determine these presents, and the license herein granted shall become null and void.

17. This license or a confirmed duplicate of it shall always be carried on board the aforesaid Pilot Boat.

The Schedule of ship Stations before referred to:—

1. Name of ship on which station established.
2. Nationality.
3. Call signal.
4. Normal range of signalling in nautica miles:—
   (*a*) by day;
   (*b*) by night.
5. Character apparatus:—
   (*a*) Radiotelegraph system with the characteristics of the system of emission;
   (*b*) Wavelengths in metres (the normal wavelength to be underlined).
6. Hours of service.
7. Power:—
   (*a*) Source and maximum output;
   (*b*) Maximum antenna energy.
8. Alternator:—
   Number of cycles per second.

COCHIN-CHINA

(See FRANCE.)

COCOS OR KEELING ISLANDS

(See STRAITS SETTLEMENTS.)

COLOMBIA

THE Republic of Colombia lies between latitude 2° 40′ S. and 12° 25′ N., its longitude extending from 68° 0′ to 79° 0′ W. Its superficial area is estimated at 461,606 square miles, its population at 5½ millions. The country is intersected by three great ranges of the Andes Mountains known as the Western, Central, and Eastern Cordilleras, the latter of which is the more important as it affords a series of vast table-lands, cool and healthy. Railroads are in their infancy and the telegraphic wiring is estimated at 12,930 miles.

CONTROL.

Control of radiotelegraphy in Colombia is vested in the Minister of the Interior, who is ultimately responsible, whilst the executive authority is wielded by the Director of Posts and Telegraphs.

ORGANISATION.

The station of Santa Marta was the first wireless installation in the Republic, that of Cartagena being next in order. There are six new stations under construction.



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ADMINISTRATION.

No special regulations have been issued through the medium of wireless legislation, but in accordance with the current Colombian laws wireless as well as wired telegraphy constitutes a public Service under State control in every way. The Government does, however, grant permission for contracts, under which radiotelegraphic service may be instituted by private companies. The United Fruit Company owns and works the station of Santa Marta and the Telefunken Company owns and works the station of Cartagena. Marconi's Wireless Telegraph Co. own and work the station of Puerto Colombia and have under construction an international station at Bogota. The station of San Andres, which is owned by the Government, was constructed by the Telefunken Co., but later refitted by Marconi's Wireless Telegraph Co., by whom it is operated on behalf of the Government.

The Government of Colombia have contracted with Marconi's Wireless Telegraph Co. for the erection of five new stations, four of which will be completed almost immediately. These will be managed and administered by the company by virtue of an arrangement with the Colombian Government.

COMMONWEALTH OF AUSTRALIA

(See AUSTRALIA.)

COMORO ISLANDS

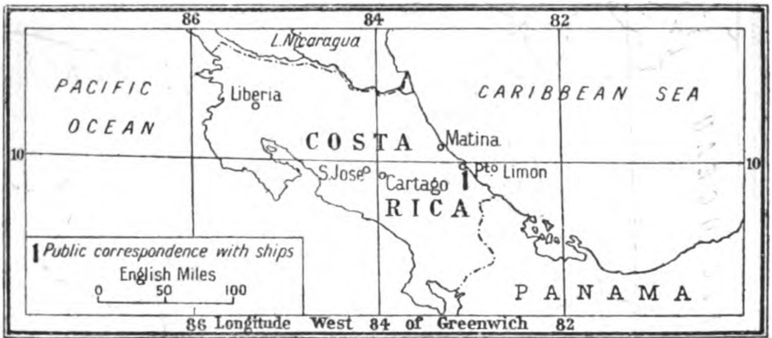
(See map on p. 446.)

COOK ISLANDS

(See map on p. 424.)

COSTA RICA

THE smallest of the Central American Republics, its territory lies between the independent Republic of Panama on the east and that of Nicaragua on the north. In area it covers about 23,000 square miles, and possesses approximately 430,000 inhabitants.



CONTROL AND ORGANISATION.

The control of wireless telegraphy and telephony is a State monopoly.

On July 25th, 1921, a contract was signed between the Government and Messrs. R. P. Lara and J. J. C. Volio, two Costa Rican electrical engineers, for the construction, maintenance and management of

(*a*) An International radiotelegraphic station of at least 10 kw.
(*b*) Other radiotelegraphic stations of sufficient power for intercommunication.

This contract is to last for 25 years, subject to a prorogation for a further 20 years according to the judgment of the Government. In the event of the prorogation not being granted, the Government has the option to purchase, but if the prorogation is granted the whole of the plant in perfect condition becomes the property of the State at the end of 45 years.

These stations are destined for public correspondence.

At present there is but one wireless station situated at Limon, the Atlantic port of the capital, San José. It is open for public correspondence with ships.

ADMINISTRATION.

Wireless telegraphy is the subject of Laws and Regulations, of which we have only been able to obtain the following :—

A—Decree 34 of 10th April, 1920 (not available).
B—Regulations relating to the Licenses.

EXECUTIVE POWER.

CONSTITUTIONAL PRESIDENT OF THE COSTA RICA REPUBLIC.

B In accordance with what is laid down in Decree No. 34, 10th April, 1920.

DECREE.

The following Regulation for wireless installations —

ART. 1.—Radiotelegraphic and telephonic stations of an amateur character or institutes of instruction may only function on obtaining a license from the Government Ministry, subject to cancellation at any time they think necessary. These stations shall use a transmitting wavelength not greater than 200 metres, and a transformer not to exceed a kilowatt, and may not use a valve of more than 5 watts except by special authorisation from the Legislative Power in accordance with Decree No. 34 above mentioned.

ART. 2.—If at the stations the transmitter is of such a nature that it radiates the energy of two or more wavelengths, more or less definite with a sensitive wavemeter, the energies, of the shortest waves may not exceed the energy of the large ones by more than 10 per cent.

ART. 3.—The logarithmic decrement by complete oscillation in the trains of oscillations emitted by the transmitter of the said stations shall not exceed two-tenths.

ART. 4.—Any persons or person who have stations or a knowledge of the management of these (previously mentioned) may not divulge or publish the contents of any message they may receive. Anyone who should be guilty of divulging or publishing any message shall be punished with a fine of 250 colons, or with three months imprisonment, or with both if it should be so decided. In the event of this offence happening the one who commits it will expose himself to the withdrawal of the license granted, and for the State to confiscate all the apparatus at his station. Those who violate correspondence will likewise be liable to penalties in accordance with the laws of the country.

ART. 5.—All the apparatus of the station mentioned in Article 1 of this Decree shall be sealed by the Inspector of Communications, and if in any of his visits to these stations he should come across a seal broken or out of place, the guilty person will render himself liable to the immediate confiscation of his installation and apparatus, and of having his license withdrawn.

ART. 6.—Official establishments for instruction, when their license is obtained, may make experiments which are useful for study whenever they do not interrupt or cause interference to the international or other offices of the Government or those in its authority.

Given at the Presidential House, on the 3rd August, 1921.

(Sd.) JULIO ACOSTA.

Secretary of State entrusted with the Public Works of the Government.

AQUILES ACOSTA.

CRETE

(See map on p. 322.)

CRETE, or Candia, by which name this interesting and mountainous land is sometimes known, forms the largest of the islands of the Greek archipelago and constitutes part of the island barrier separating the Ægean Sea from the main body of the Mediterranean. Its length is about 140 miles and its breadth averages less than 30.

During the war a wireless apparatus existed in this island for the use of the British Naval and Royal Air Force base at Suda Bay, but this has since been dismantled.

Before the war a site was selected near Mournees in the vicinity of Canea, and the construction of a wireless station was begun under the superintendence of Greek officials sent for the purpose from Athens, but the work was suspended on the outbreak of hostilities. Some time ago eight or nine engineers connected with the Marconi Company, and employed on work at Athens and Smyrna went over and inspected the partial construction. They returned to make their report and it is expected that the station will be completed in the near future.

CUBA

THE largest of the islands in the Caribbean Sea, the territory of Cuba occupies an area of about 44,000 square miles—*i.e.*, roughly one-third the size of the United Kingdom. The capital city is Havana, with a population of about 360,000. The country was in Spanish occupation from its discovery until the signature of the Paris Treaty in December, 1898, when it assumed independence. The language of the country, however, remains Spanish.

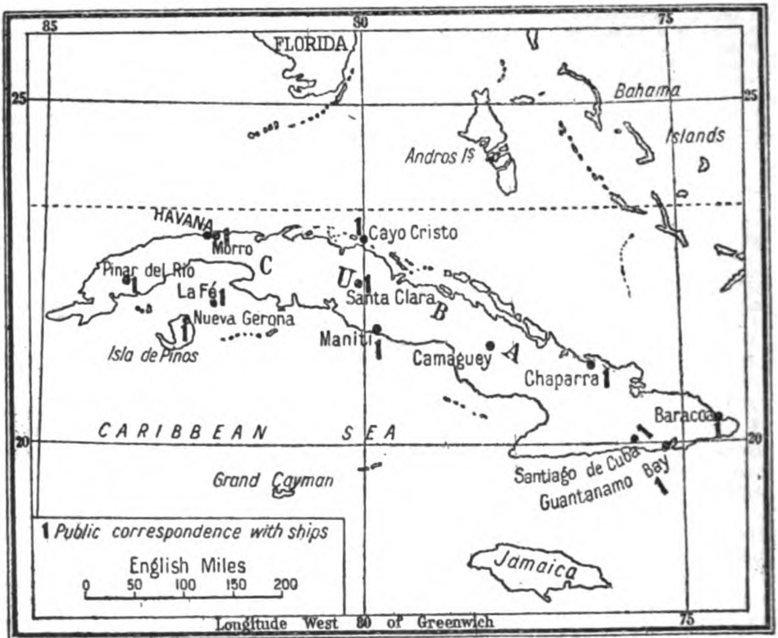
There are some ten wireless stations in the Republic, open to public correspondence with ships, and their position is shown on the map on page 238.

CONTROL.

The radiotelegraph service in Cuba is controlled by the Government and is carried on under the direction of the Department of Communications.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Sr. Mignel Paniagua	Director-General of the Department of Communications	Havana
Sr. Carlos Barnet	Sub-Director of the Department of Communications	Havana
Sr. Pedro Pablo Torres	Chief of the Division of Technical Inspection	Havana



ORGANISATION.

The radiotelegraph service of Cuba was inaugurated in the year 1906 by the establishment of two small stations installed at the landing places of Mariel and Nueva Gerona, on the Island of Pinos, the said stations being assigned to the handling of internal correspondence.

In 1909 the station of Mariel was abolished and the service extended by the installation of four new stations distributed amongst the ports of Havana, Santiago de Cuba, and the towns of Santa Clara and Camaguey. The four stations were instituted for the rendering of a public service, in general, and they filled a great want in view of the large number of vessels navigating the territorial waters of the Island.

Following the dictates of experience, the stations of Santiago de Cuba and Camaguey were removed to the coast towns of Chaparra and Baracoa, and a new station was established in the town of Pinar del Rio.

At present seven coast stations exist, all of which are open for public correspondence with ships.

As experimental stations worthy of mention may be cited that of the Colegio Francés (French College) of Cienfuegos, and that of de Belén, of Havana, the latter being assigned to the reception of meteorological signals.

In addition to the coast stations shown in the foregoing statement, the Cuban Government has under its jurisdiction over twenty ship stations installed on vessels of the Navy and merchant vessels belonging to private companies.

ADMINISTRATION.

The Cuban Administration adhered to the Radiotelegraph Convention of London in January, 1918; but owing to reasons that are irrelevant here, this adherence was not formalised until February, 1920. For this reason

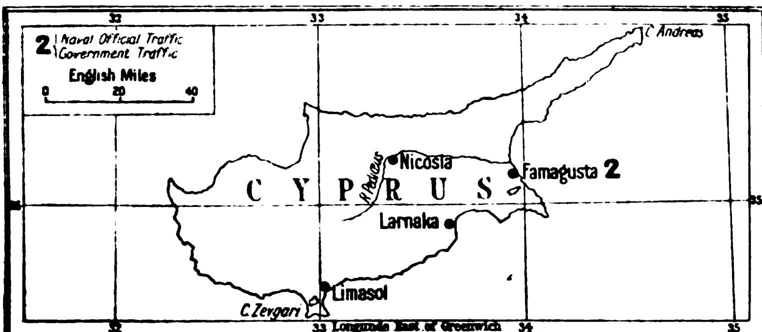
the administrative side of the radiotelegraph service is actually in process of organisation and the laws and regulations by which it will be governed are being studied. It is hoped to include their text in our next edition.

CURAÇAO

(See NETHERLANDS.)

CYPRUS

THE declaration of war upon Turkey by the British Government on November 5th, 1914, released this island from allegiance to the Ottoman Empire, and it was thereupon annexed by Great Britain. Occupying a strong strategical position in the Levant, it proved of immense value to the Allies during the late world conflict. At its shortest distance (to Asia Minor) it lies 35 miles from the mainland, whilst about 50 miles separate it from the nearest point on the Syrian coast. The island constituted the base for several of the Egyptian campaigns, as its climate forms a pleasant and refreshing contrast to the tropical heat of the North African deserts. In area it covers 3,584 square miles. The government of the island is administered by a High Commissioner (appointed by Great Britain) with the advice and consent of the Legislative Council. At present there are no wireless stations on the island.



ADMINISTRATION.

The following Act provides for the regulation of wireless telegraphy in Cyprus:—

A—Wireless Telegraphy Law, 1913.

A Law enacted by His Excellency the Officer Administering the Government of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, to provide for the Regulation of Wireless Telegraphy.

A Be it enacted by His Excellency the Officer Administering the Government of the Island of Cyprus, with the advice and consent of the Legislative Council thereof, as follows:—

1. This Law may be cited as the Wireless Telegraphy Law, 1913.

2. In this Law:—

"Wireless telegraphy" means any system of transmitting messages or other communications by means of electric galvanic or magnetic signals without the aid of any wire connecting the points from and at which the messages or other communications are sent and received, and includes any apparatus for transmitting or receiving such messages or other communications.

Provided that nothing in this Law shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The High Commissioner in Council may whenever he shall deem it expedient to do so license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in Cyprus or on board any ship registered in Cyprus.

4. (1) No person shall establish any wireless telegraph station or instal or work any appara-

tus for wireless telegraphy in any place in Cyprus or on board any ship registered in Cyprus except under and in accordance with a license granted in that behalf by the High Commissioner.

(2) Every such license shall be in such form and for such period as the High Commissioner in Council may determine and shall contain such terms conditions and restrictions on and subject to which the license is granted as the High Commissioner in Council shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a license in that behalf or instals or works any apparatus for wireless telegraphy without a license in that behalf he shall be liable to a fine not exceeding one hundred pounds or to imprisonment with or without hard labour for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license but no proceedings shall be taken against any person under this Law except with the previous sanction of the King's Advocate.

(2) If a judge of a District Court or of the Supreme Court is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf he may grant a search warrant authorising the person to whom it is addressed to enter and inspect the station place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The High Commissioner in Council may make regulations for all or any of the following matters :—

(*a*) for prescribing the form and manner in which applications for licenses under this Law are to be made ;

(*b*) for prescribing the fees payable on the grant of any license ;

(*c*) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship of any nationality in the waters of Cyprus shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established installed or worked in Cyprus or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea ;

(*d*) for prohibiting except with the special or general permission of the Island Postmaster the working or using of any apparatus for wireless telegraphy on board a merchant ship of any nationality whilst such ship is in any of the harbours of Cyprus ;

(*e*) for prohibiting or regulating in case at any time in the opinion of the High Commissioner an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships of any nationality in the waters of Cyprus the use of wireless telegraphy on board such ships while in such waters by such further rules as the High Commissioner may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraphs (*c*), (*d*) and (*e*) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the High Commissioner in Council that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy a license for that purpose shall be granted subject to such special terms conditions and restrictions as the High Commissioner in Council may think proper but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Law or of any Regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Law and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine not exceeding fifty pounds.

(2) All convictions forfeitures and fines under this Law or any Regulations made thereunder may be had and recovered before a District Court.

9. This Law shall come into operation on the 1st day of July, 1913.

Passed in Council the twenty-third day of May, in the year of Our Lord one thousand nine hundred and thirteen.

CZECHO SLOVAKIA

THE Czecho Slovak Republic, with its capital Prague, is geographically nearly at the centre of Europe. This physical factor is being taken advantage of by the Ministry of Posts and Telegraphs to make Prague a kind of telegraphic centre.

The annexed map will show the definition of the country's boundaries and the location of such wireless stations as are known to exist.



Officials Controlling Wireless Telegraphy.

Official.	Title.	Address.
Mr. Anthony Srba	Minister of Posts and Telegraphs	Prague
Dr. Maximilan Fatka	Director-General of Posts and Telegraphs	Prague
Mr. Emil Breicha	Vice do.	Prague
Mr. Augustus Sandor	Engineer, Chief of the Technical Section	Prague

With the utmost despatch a transmitting station is being erected near Prague at Podebrady. It will be operated from the main office at Prague by means of a relay. The station will be of the high frequency alternator type with 50 kw. in the aerial. It is intended for European International wireless service, and will be augmented at a later date by the addition of a second 50 kw. high frequency alternator, the combination giving altogether 100 kw. in the aerial, when it will be used for trans-continental communication. Until this station has been completed transatlantic correspondence will be transmitted *via* the new French station at Sainte-Assize, near Paris, by agreement with the Société Française Radio-Electrique.

In addition to this high-power station it is proposed to instal a 5 kw. valve reserve plant, and at all important places in Czecho Slovakia small power valve stations of from 250 watts to 5 kw. for inter-communication. Wireless telephony will also receive considerable attention.

For the aeronautical service a station is being erected at Kbely, near Prague, where is situated the main aerodrome in Czecho Slovakia.

Meteorological news will be sent out from most of the new stations.

There are no licenses issued, the erection of wireless stations and their management being exclusive to the Czecho Slovak Administration of Telegraphs.

DEMERARA

(See British Guiana.)

DENMARK

(See map on p. 418.)

THE area of the Kingdom of Denmark, including the territory added as a result of the recent plebiscite, totals 17,082 square miles. The country is ruled under a Constitutional Monarchy, the Crown of Denmark having been elective from the earliest times.

The territory ruled by King Christian X includes the peninsula of Jutland and several islands in the Baltic Sea, the most important of which are Sealand and Funen; also the Faröe Islands (north of the Shetlands) and Greenland. The Government is what is called a Parliamentary Government, the executive power being vested in the Sovereign (acting through his Ministers), assisted by the Cabinet consisting of twelve Secretaries of State, whose power rests upon the possession of a majority in the Lower House (Folketinget). The Constitution rests on the fundamental law of June 5th, 1849. This fundamental law has, however, been revised by Parliament, and was ratified by the King on June 5th, 1915, becoming effective on May 6th, 1918.

CONTROL.

Wireless Telegraphy is naturally of considerable importance to a maritime nation like that of the Danes, whose fatherland is at no point any great distance from the sea. It is a Government monopoly, and the administration is supervised by the Minister of Public Works.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
Mr. M. Slebsager	Minister of Ways and Communications.	Copenhagen V., Vesterbrogade 198.
Mr. N. Meyer	Director of Telegraphs	Copenhagen B., Vesterbrogade 40.42.
Mr. W. Thomsen	Engineer in Chief of the Telegraph Department.	Copenhagen B., Vesterbrogade 40.
Mr. W. Bjarnov	Chief Engineer, Inspector of Wireless Installations and Instruction.	Copenhagen B., Hammerichsgade 14.
Mr. H. Schledermann ..	Electrical Engineer in Chief, Royal Danish Navy, Inspector of Wireless Installations and Instruction.	Taffelbays Alle 11, Hellerup.

ORGANISATION.

Originally radiotelegraphy was adopted in Denmark by the Lighting Department (1901) and by the Royal Navy (1902), but later on the commercial use of radiotelegraphy was organised under the supervision of the Telegraph Department and the State Railway Department (both acting under the jurisdiction of the Department of Public Works); the Naval Department and the Lighting Department (both under the Admiralty), and the War Office. These various departments exercise jurisdiction independently over their own radiotelegraphic section.

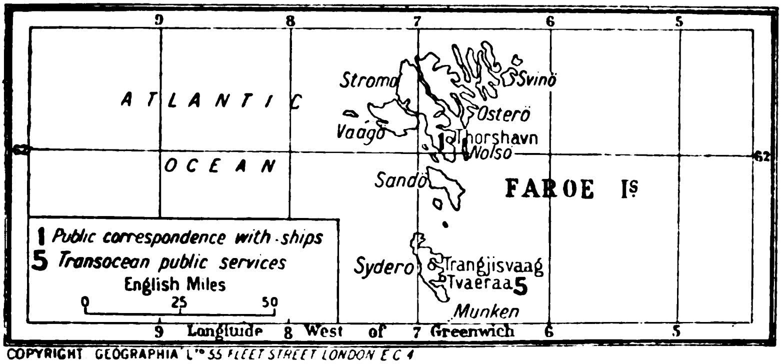
The first stations erected were those at Blaavandshuk (lighthouse) and on board the Horns Rev (lightship), both of them dating from 1901. The latest available statistics enumerate :—

Land Stations.

(*a*) Seventeen directly controlled by Government (two of them situated in the Faröe Islands).

(*b*) One experimental station (Lyngby Radio), belonging to the Telegraph Department (not included under (*a*)).

(*c*) Two instructional stations (Svendborg Radio), with corresponding station Jylland (frigate).



SHIP STATIONS.

(*a*) Two hundred and fourteen with lower power.
(*b*) Seventy-five Government vessels.
(*c*) One hundred and forty-nine private vessels.

No forms of license for radiotelegraphic working have been issued. The regulations for the erection and operation of private wireless stations are under revision, but it is not yet possible to give details. Laws regarding wireless in its application to aviation are also projected, but so far have not eventuated. The Danish Government contemplates the purchase of a radiotelegraph station for the reception of time and meteorological signals, and of a high power station for transatlantic service.

There are no arrangements for the transmission of Time, Weather, Meteorological, Hydrographic and Press Signals, but a report of the atmospheric conditions in Danish waters can be obtained from the Wireless stations of Copenhagen and Blaavand on the payment of one franc. The other Meteorological services are obtainable at reduced rates from the Lyngby Radio Station, and if Ice Service has been ordered a report is sent from Copenhagen at 11 a.m. and 9 p.m. G.M.T.

Radiotelephonic communication between the Island of Bornholm and the rest of Denmark will be completed in the near future.

ADMINISTRATION.

The first Act to regulate radiotelegraphy in Denmark was passed in 1907 (Act No. 99 of April 19th). New regulations became effective on July 1st, 1913. Both are reprinted below.

Special regulations for experimental stations, instructional stations, etc., became effective in August, 1914, and are given *in extenso* below.

A—Act 99 of 1907.
B—Rules dated July, 1913.
C—Regulations for Special Stations.
D—Agreement between Denmark, Norway and Sweden regarding expeditious forwarding of radiotelegrams. (See Norway.)

A The regulations affecting Wireless Telegraphy in Denmark are based upon:

ACT No. 99 OF APRIL 19TH, 1907.

1. The Government shall have the sole right to erect and operate wireless telegraphs (radiotelegraphs) within the Danish boundaries and maritime territory.

2. Telegraph stations on board ships under foreign flag must only be utilised on Danish maritime territory when following the regulations to be drawn up in this respect by the Minister for Public Works. The Minister may prohibit every kind of telegraphic communication from such stations and take the necessary measures to carry through such prohibition, when in his opinion circumstances require it.

3. On board ships under Danish flag, not owned by the Government, telegraphic stations must only be fitted and operated both on

and outside Danish maritime territory according to license previously obtained from the Minister of Public Works. In case the conditions concerning the fitting and working of the station stipulated in the license are not maintained, the Minister may cancel the license.

In case it is desired that the working of stations being in operation at the time when the Act comes into force, should be continued, an application to that effect must be filed with the Minister for Public Works not later than four weeks after the Act has come into force, the Minister having then to decide whether and on what conditions the operation of the station may be continued.

4. Scientific and technical trials with wireless telegraphy must be made by no others than the State Authorities unless permission to that effect has been previously obtained from the Minister for Public Works.

5. The regulations stipulated in Act No. 84 of May 11th, 1897, Art. 17, concerning the duty as to secrecy incumbent on the officers and functionaries of the Telegraph Department and concerning the punishment they may be subjected to in the case of a breach of the aforesaid duty, should also be applicable to wireless operators. The regulations stipulate in Art. 18 of the same Act concerning corresponding regulations for employers of private companies may also be made applicable towards operators on board ships.

6. Any contravention of the regulations given in Articles 1—4 shall be punished, provided that the circumstances concerned according to their nature do not inflict a more serious punishment, with forfeiture of the apparatus unlawfully placed and utilised. Furthermore, the contravening person may be liable to a fine of up to 400 kroner, which fine shall devolve to the Treasury. Such contraventions shall be dealt with in the same way as public police cases. The Minister for Public Works shall be the only person entitled to institute proceedings against contraveners of this Act.

REGULATIONS.

B MADE EFFECTIVE ON JULY 1ST, 1913. In accordance with Act No. 99 of April 19th, 1907, concerning wireless telegraphs (radiotelegraphs) and the International Convention concerning radiotelegraphs drawn up in London on July 5th, 1912, supplemented by appendix decisions, finishing protocol and service regulations, the following decisions shall be observed in founding and working of radiotelegraph stations and in the handling of radiotelegrams:

I.—ESTABLISHING OF RADIOTELEGRAPH STATIONS.

1. On Danish soil and on board ships permanently anchored such as lightships, etc., radiotelegraph stations (coast stations) can only be established by the Government.

2. On board ships under Danish flag, not owned by the Government, radiotelegraph stations (ship stations) may only be established and operated after permission has been previously obtained from the Department of Public Works.

The license or a certified duplicate of it must always be kept on board the ship.

The license may be withdrawn if the conditions for the fitting and operation of the station set out therein are not complied with; in such cases the entire apparatus belonging to the station must be removed.

3. Applications for licenses to establish and operate radiotelegraph stations on board ships sailing under the Danish flag must be drawn up on forms approved of by the Department of Public Works, delivered and sent in duplicate to the Telegraph Department, and must be supplied with an endorsement to the effect that the station will fulfil the following conditions:

(*a*) The waves transmitted must be as pure and as little damped as possible; the utilisation of transmitting apparatus, by which the transmitted waves are generated by a direct sparking discharge in the antenna, especially, is only permissible in case of need. This latter arrangement of the transmitter may, however, be permitted in the case of certain special stations (as, for instance, on board small vessels), the primary energy of which does not exceed 50 watt.

(*b*) The speed of transmission and reception must be no less than twenty words a minute, the word to consist of five letters. New installations utilising an energy of more than 50 watt must be fitted in such a way as to make it easy to obtain more telegraph distances, smaller than the normal ones, the smallest of which should be about 15 nautical miles (equal about 28 km.). Old installations utilising an energy of more than 50 watt must be altered, if possible, so as to comply with the regulations mentioned above.

(*c*) The receiving apparatus, protected in the best possible way against disturbances, must be able to receive signals with the wavelengths of up to 600 m., which are stipulated for the ship station.

(*d*) The primary energy of the station measured across the generator must under no circumstances exceed 1 kw.

(*e*) Larger energy than 1 kw. may, however, be utilised, if the ship is to interchange telegrams over a distance of more than 200 nautical miles (equal 370 km.) with the nearest station, or if communication, due to interference is not obtained unless by an increase of the transmitting energy.

(*f*) The station must be operated by one or more operators who have obtained certificates as specified below in Section 7.

The station must not be opened for communication until the telegraph department has issued a certificate, which will not be granted until the department, by inspection, is satisfied that the conditions set out in the licence granted by the Department of Public Works have been fulfilled.

II—INSTALLATION, SERVICE AND OPERATION OF PRIVATE SHIP STATIONS.

4. The apparatus of ship stations must at any time be in strict accordance with the conditions set out in the license for their establishment.

5. The hours of service of each coast station are decided by the Government Department.

As far as the hours of service of ship stations are concerned, these stations are divided into the following three classes:

(1) Stations with continuous hours of service;

(2) Stations with limited hours of service and

(3) Stations with no fixed hours of service.
During navigation stations with continuous hours of service must be attended to constantly at the aural apparatus. In the case of stations with limited hours of service the aural apparatus must be attended to during all of the hours of service as well as during the first ten minutes of each hour not comprised in the normal hours of service. Stations with no fixed hours of service are not obliged to keep any regular watch over the aural apparatus.

The classification of a ship as regards the hours of service of same shall be stated in the licence.

6. Any ship station must be fitted to utilise wavelengths of 600 m. and 300 m. respectively. The normal wavelength is 600 m. Small ships, may, however, be allowed to utilise wavelengths of 300 m.; but they must always be able to receive telegrams with a wavelength of 600 m. During the hours of service each ship station must be capable of being called with its normal wavelengths.

Ship stations maintaining continuous watch and ship stations with limited hours of service shall be bound to have a radiotelegraphic spare installation, the single parts of which must be placed as safely as possible. This installation must have a source of energy of its own and must be capable of being put into use quickly, must be able to work satisfactorily for at least six hours and must have a minimal range of:

80 nautical miles (equal to about 150 km.) for ship stations belong to the first class (maintaining continuous watch).

50 nautical miles (equal to about 100 km.) for ship stations belonging to the second class (with limited hours of service).

This special installation is not required in the case of ships, the normal installations of which comply with the requirements of spare nstallations mentioned above.

7. The service of the ship station must be maintained by operators who are in possession of certificates granted by the Department of Public Works.

In cases of urgent necessity and during one voyage only the service of a ship station may be undertaken by one or more operators holding a certificate from a foreign Government which Government has joined the International Convention concerning radiotelegraphs.

The certificate shall certify

Partly the ability of the operator:

(*a*) In the maintenance of the apparatus and knowledge of their working.

(*b*) In the sending and receiving (by sounding) of telegrams with a speed:

(1) No less than twenty words a minute for obtaining a certificate of first class, and

(2) No less than twelve words a minute for obtaining a certificate of second class.

(*c*) In the knowledge of the regulations utilised, governing radiotelegraphic service.

Partly that the operator shall be bound to secrecy and subject to penalty, etc., for a breach of this condition as in the case of State telegraph operators.

Operators holding a certificate of second class may do service:

(*a*) On board ships utilising radiotelegraph in their own service or for the correspondence of the crew only.

(*b*) As assistant operators on board all ships having at least one operator holding a certificate of first class.

Ship stations with continuous service must be operated by at least two operators holding a certificate of first class.

The radiotelegraphic service of the ship stations is placed direct under the master of the ship concerned.

In the event of a contravention of the regulations governing the operation of the radiotelegraphic service, the certificate may be cancelled by the Department of Public Works.

No unauthorised person must be allowed to enter the wireless cabin.

8. If technically possible, ship stations must interchange telegrams with other stations (coast or ship stations), without regard to the system of radiotelegraphy employed at the station concerned. The interchange of telegrams with other ship stations must, however, be so arranged that the working of coast stations is not interfered with, these as a rule having the priority in public telegraph service.

The operation of a station must as far as possible be arranged so that it does not interfere with other stations.

Exchange of superfluous signals and words is prohibited. Experiments and practice shall only be permitted in so far as the service of other stations is not interfered with; therefore, they must be executed with no other wavelengths than those utilised in the case of public telegram exchange, and utilising as little energy as possible.

When a ship is in a Danish harbour her station must only be utilised for communcation with ships in distress.

9. According to the London Convention, the Telegraph Department must notify the Berne Bureau of the ship installation, and the Telegraph Department can demand to be furnished with any information regarding the installation, service, and working of a ship station, both for this and for other purposes.

10. The Telegraph Department will see that all conditions for the fitting and operation of ship stations are complied with. The inspectors for this purpose, who are selected by the Director of Telegraphs, must at any time on showing their authority be admitted to inspect and test the station, provided that the ship is within Danish waters. All information required by the said inspectors must be immediately given, and their directions must be complied with, pending the decision of the Director of Telegraphs, or, that of the Department of Public Works.

For the proper carrying out of the inspection each of the inspectors shall be paid 20 kroner for the inspection and a daily remuneration in addition to travelling expenses; such amount shall be paid by the Telegraph Department, but will have to be refunded (on demand) by the owners of the ship in question.

III—Handling of Radiotelegrams.

11. Radiotelegraph stations open for public service for the transmission and reception of telegrams may be used by any person, unless the public telegram exchange at the station in question is limited to a certain special kind of telegrams (see section 14).

The telegrams are divided into three classes:

(1) State telegrams.
(2) Service telegrams.
(3) Private telegrams.

The right to transmit State telegrams and service telegrams, and the right to priority for such messages, is at any time governed by the provisions embodied in the International Telegraph Regulation and the Inland Telegraph Regulation governing the transmission of such telegrams over ordinary telegraph systems.

12. Regarding the radiotelegraph traffic, the handling of telegrams is governed by the International Radiotelegraph Service Regulation, Articles XIV-XV, XIX-XL, XLV-XLIX. The handling of telegrams to and from coast stations and over the ordinary telegraph and telephone system is at any time governed by the Inland and International regulations for such traffic.

13. State and service telegrams may under all conditions be written in code or cipher. Private telegrams in code or cypher may be interchanged only with coast stations of such countries where this method of communication is allowed.

14. The ship station may be licensed for :

Ordinary public telegraph communication.

Limited public telegraph communication (with specified ships, with specified shipping lines, etc.).

Private telegraph communication.

Special telegraph communication (exclusively for State use, etc.).

In the public telegraph communication the following special radiotelegrams are to be received and handled :

(1) Radiotelegrams with prepaid reply.

(2) Radiotelegrams (collated telegrams).

(3) Radiotelegrams to be delivered by express messenger.

(4) Radiotelegrams to be delivered by post.

(5) Radiotelegrams with more addresses than one.

(6) Radiotelegrams with certificate of arrival. Certificates of arrival are handled on lines of telegraphs only.

(7) Paid service messages, except such as require a repetition or an information.

(8) Express telegrams, which are, however, only transmitted as such on the ordinary lines of telegraphs and under the proviso that the prescriptions of the International Telegraph Regulations are followed.

All stations are bound to receive, answer, and, if possible, further to communicate messages from ships in distress and give these absolute priority.

Ship stations, however, have no responsibility whatever regarding the radiotelegraph communication.

Ship stations intended for public telegraph service shall get such printed forms, service journals, tariff lists, etc., as are necessary for this service, from the Telegraph Department against payment of fixed amouuts. It is the duty of the station to take care that a sufficient supply of these things is always available. Such stations must furthermore be governed by all the instructions regarding the installation and operation of the station and the handling of the traffic issued by the Telegraph Department.

15. The abbreviations mentioned below covering the terms also mentioned below may be utilised; they are written between two double hyphens before the address, and are charged as one word :

To be delivered to addressee only	MP
Delivered open	Ouvert
Private express telegram	Urgent or D
x Addresses	TMx
Reply paid x	RPx
Urgent reply paid x	RPDx
Collation	TC
To be delivered per post	Poste
Télégraphe restant	TR
Poste restante	GP
Post registered	PR
Poste restante registered	GPR
Telegraphic certificate of arrival	PC
Telegraphic urgent certificate of arrival	PCD
Certificate of arrival by post	PCP
Express messenger	Express
All addressed to be stated	CTA

16. The entire charge for radiotelegrams shall include :

(1) Charge for the radiotelegraphic handling, namely :

(*a*) "Coast fee," which shall devolve on the coast station.

(*b*) "Ship fee," which shall devolve on the ship station.

(*c*) "Transit fee," for the coast or ship stations being intermediary stations at the handling of the telegrams.

(2) Charge for handling over the ordinary telegraph and telephone system paid according to the general regulations.

The coast fee for Danish coast stations shall be 40 ctm per word, minimum 4 fr.

The snip fee shall be fixed by the owner of the ship station, subject to the approval of the Department of Public Works. It must not exceed 40 ctm. per word ; a minimum charge per telegram may, however, be adopted, not exceeding the charge for ten words. Service telegrams concerning telegrams handled exclusively per radiotelegraph are handled without any charge between the radiotelegraph stations, but are liable to charge when passing lines of telegraphs. Press telegrams at a reduced charge will not be received.

17. The entire charge for the handling of a radiotelegram from the sender to the addressee is to be collected from the sender by the station where it originates. The stations must not collect larger amounts than allowed in the tariffs.

18. All pecuniary liability in consequence of the operation of the ship stations is payable entirely by the owners of the ship in question, without regard to whether the liability in any case may have been due to fault or neglect on the part of the operators.

19. The original radiotelegrams with the vouchers pertaining thereto must, if possible, be sent once a month by the ship stations to the Telegraph Department.

20. Reimbursements of charges paid, and accounts with the Telegraph Department, are governed by the International Radiotelegraph Service Regulation, Articles XLI and XLII.

IV.—Other Regulations.

21. Stations on board ship under foreign flags must not be operated during the time such ships are in a Danish harbour, except to receive, answer and forward messages from ships in distress.

22. When the interests of the State require it, the Government may reserve to itself the right to prohibit all radiotelegraphic communication from ships, Danish or foreign,

in Danish waters, and to make the necessary regulations to carry through such prohibition.

23. The maximum penalty payable to the State by the owners or radiotelegraphic company concerned for contravening the foregoing regulations is 400 kroner (£22), and all unlawfully fitted or utilised apparatus may be forfeited. Such contraventions are dealt with in the public police court, and proceedings may only be taken according to demand by the Minister for Public Works.

24. These regulations shall come into force on July 1st, 1913.

C REGULATIONS FOR THE ERECTION AND WORKING OF PRIVATE RADIOTELEGRAPHS

(Experimental Stations; Instructional Stations; Stations to Receive Time Signals, Meteorological Reports, etc., etc.).

1. License to establish and operate private radiotelegraphs can only be granted to persons above eighteen years of age, who are Danish subjects and have their residence in Denmark. It is not to be expected that the licence, which cannot be transferred to or utilised by others except in accordance with the consent of the Telegraph Department, be granted, unless it is considered to be of actual value to the person concerned or the scientific or technical development of Wireless Telegraphy or Telephony.

Application for the license drawn up in duplicate and provided with signature is to be sent to the Telegraph Department; same must contain exact information with regard to the full name, age, residence, previous training, present position, and occupation of the applicant, as well as whether he is a Danish subject or not. The applicant must state exactly the scientific, technical, practical or other purpose for which the erection of the station is intended; furthermore he must send in a diagram of connections for and a description of the projected station as well as particulars about the energy by which the station is intended to work; furthermore the name of the wireless land or ship station or stations with which the station of the applicant wants to communicate.

2. It is under no circumstances allowed to transmit telegrams or messages, unless such telegrams and messages have absolute reference to the radiotelegraphic service of the station concerned.

Signals of distress or messages and enquiries concerning assistance or the like, occasioned by disasters at sea form, however, an exception from the above, the station being bound to receive and immediately retransmit such messages to the proper persons by means of its apparatus or in some other way.

3. Communication, experiments and the like, with other wireless stations outside Danish waters is not allowed unless the consent of the Telegraph Department has been previously obtained.

An application to that effect must contain the name, location and licensee of the foreign land or ship station or stations, with which communication is wanted. A license, if such one be obtained, does not entitle to communication with other foreign stations than those mentioned in the license.

4. Stations equipped with transmitters must by no means interfere with the radiotelegraphic communication of other land or ship stations or the public telegraph or telephone traffic. These stations will receive from the Telegraph Department a call signal of their own, and shall answer as soon as this call signal has been observed. Every transmission of signals shall be stopped the moment this is demanded radiotelegraphically or in another way by a Danish wireless land or ship station open to public communication.

5. No transmission of signals must take place until the station has convinced itself that no communication is taking place which might be interfered with by such transmission.

6. The station is liable to be a client of the local telephone net of the place, so that telephonic connection with it can be obtained quickly.

7. The license and those persons who are allowed to use the staions out of actual instructional purposes must sign a declaration to the effect that they bind themselves to keep secret the contents of such wireless telegrams as might be brought to their knowledge through the wireless station.

These declarations shall be written on special forms, which latter are to be sent to the Telegraph Department duly filled in and signed.

8. In the case of stations equipped with transmitting apparatus, the licensee must be familiar with and strictly maintain the Regulations of the International Radiotelegraph Convention and the Service Regulations annexed thereto, in so far as these regulations have reference to the station concerned.

9. Stations equipped with both transmitting and receiving apparatus, which have not been expressly mentioned in the license as experimental stations, must use in general no other wavelengths than 200 metres and below. Should it turn out to be necessary—in order to obtain the purposes intended for the erection of the station—to use larger wavelengths than the above mentioned, the station shall be exclusively worked by such wireless operators as are holders of a certificate of first or second class as prescribed according to the notification of the Department of Public Works of June 27th, 1913. The transmission of signals over wavelengths from 600 to 1,600 metres inclusive will entail an immediate withdrawal of the license.

10. The stations mentioned in Article 9 shall generally not use a larger primary energy than ½ kw. Should the utilisation of a larger energy than the above turn out to be necessary in order to obtain the purpose intended for the erection of the station, the working of same be undertaken by a trained wireless operator as mentioned in Article 9.

It is necessary that the primary energy of the station can be read from permanently installed meters.

The utilisation of transmitting apparatus by which the generation of the transmitted waves takes place by direct discharge of sparks in the antenna is not allowed.

11. Receiving stations, which shall receive nothing but signals (time signals, meteorological reports, and the like) shall be arranged in such a way as to be able to receive at most only two wavelengths; they shall be arranged in such a way that the licensee can only vary the tuning very little from the wavelength or wavelengths fixed, and the deviation from one wavelength must not exceed five per cent. up or down.

The receiving apparatus shall be enclosed

in a case in such a way that it can be worked from the outside only by the handle of the tuning contrivance. The shifting of detector and telephone shall, however, take place without it being necessary to open the case, which is to be plumbed by an inspector from the Telegraph Department.

With the exception of the coupling of the detector and telephone, the remaining connections of the receiver—also the connections from the aerial net and water or earth—shall be carried out inside the plumbed case and made so immovable (by soldering together) that a change of the tuning beyond the permissible limits cannot take place.

Later couplings of connections or tuning arrangements are not allowed.

12. When the station is not used and cannot be called, the aerial net (the antenna) must be put direct to a good water or earth connection.

13. The station must not be used until it has been examined by an inspector from the Telegraph Department. If the examination has turned out to be favourable the licensee will receive from the Telegraph Department an information in writing to the effect that the station may be used. An amount of Kr. 10.00 is to be paid for the examination, together with the travelling expenses of the inspector. The amount is to be paid to the Telegraph Department as per bill.

14. Produced under the authority of the Telegraph Department it will be examined as often as is deemed necessary, whether or not the provisions prescribed for the utilisation of the station are maintained; in general this examination will take place once a year. The expenses in connection with this examination to be paid by the licensee in accordance with the same rules as are mentioned in Article 13.

15. The installations of the stations shall satisfy the provisions being at any time in force for the establishment of similar electric plants, and the necessary notices of warning shall be placarded on all places accessible to strangers. When the plant of a station undergoes a change of some importance, this shall immediately be brought to the knowledge of the Telegraph Department.

16. It is exclusively incumbent on the licensee to pay any damage caused by the plant of the station (apparatus and aerial net) to a person or his property.

17. The conditions prescribed for obtaining a license to establish and work a station can at any time be supplemented and changed should circumstances make it necessary.

18. The license to work a station can be withdrawn at any time and without notice. This will always happen, in case the above conditions for obtaining a license be not strictly maintained, and the licensee has no right to claim any compensation for the withdrawal of the license. If the license be withdrawn the licensee shall—under penalty pursuant to Act No. 99 of April 19th, 1907, section 6—immediately remove all of the apparatus and antennæ of the station.

Every abuse of the station, every transmission of false signals, or the fact that strangers gain admittance to use the transmitting apparatus of the station, will entail a withdrawal of the license granted. In such case the offender might even be liable to penalty.

THE TELEGRAPH DEPARTMENT.

August, 1914.

DOMINICA (B.W.I.)

(See LEEWARD ISLANDS.)

DOMINICAN REPUBLIC

(See SANTO DOMINGO.)

DUTCH EAST INDIES

(See NETHERLANDS.)

EAST AFRICAN PROTECTORATE

(See KENYA COLONY.)

ECUADOR

THE Republic of Ecuador comprises the provinces which formed the ancient Presidency of Quito, the Colon Archipelago (Galapagos Islands) and the so-called Orient Territory. The fifteen provinces have a total area of 55,000 square miles, that of the Archipelago being 2,900 square miles. The Orient Territory is largely unexplored, and its south boundaries are in dispute. Its inclusion makes the total area of Ecuador anywhere between 160,000 and 270,000 square miles. No complete census has ever been taken, but it is estimated that the present population is about 2,000,000.

The Government of Ecuador, according to the Political Constitution of 1830, is republican, representative and democratic. It is composed of the Legislature, the Executive and the Judicature. The Legislature, or National Congress, comprises the Senate and the Chamber of Deputies. The Executive

is wielded by the President of the Republic, who is elected by popular vote every four years, and who is responsible for the appointment of the Ministers of State, Governors of Provinces, etc. The Judicature is exercised by the Supreme Court, High Courts, and other tribunals established according to the Constitution.

CONTROL AND ORGANISATION.

On the 1st March, 1920, the Government decreed the official monopoly of wireless communications in the territory of the Republic, and on the 17th April of the same year Ecuador adhered to the International Radiotelegraphic Convention of London, 1912.

The organisation and everything concerning wireless telegraphy and telephony is under the Direction of the Minister of the Interior, assisted by the Director-General of Telegraphs.

Officers and men in the Guayaquil artillery school are put through a comprehensive course in radiotelegraphy with the aid of laboratory apparatus.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Señor Don Guillermo Destruge ..	Director-General of Telegraphs	Quito
General Delfin B. Triviño	Minister of the Interior	Do.

The first wireless telegraph station was installed in 1913 at Guayaquil by Señor Don Geo. Chambers Vivero, Captain of the Port, for the purpose of communicating with vessels navigating in the Guayaquil River. It has a range of about 80 miles. The Marconi Company has recently completed a station at Santa Elena Point having a range of over 500 miles.

There are at present three radiotelegraph stations, one at Quito, the capital of the Republic; and two coast stations, one at Guayaquil, the principal port, and Esmeraldas.

The stations at Quito and Guayaquil are intended to ensure the more efficient communication between those two towns and to correspond with the station of Esmeraldas. The stations at Guayaquil and Esmeraldas also correspond with ships.

These stations were constructed by the Société Française Radio-Electrique of Paris and are on the musical spark system. The stations at Quito and Guayaquil are 10 kw., with antenna of 100 metres and the station at Esmeraldas is 5 kw., with antenna of 50 metres; each are of the umbrella type. Their wavelengths are as follows:—

*Guayaquil	..	3,200m., 2,500m., 1,800m., 600m.
Quito	..	3,200m., 2,500m., 1,800m.
Esmeraldas	..	2,500m., 1,800m., 600m.

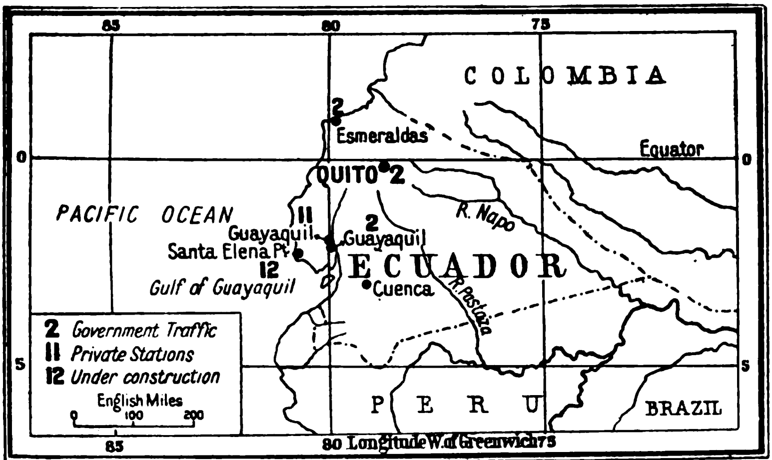
The Marconi Company has a 5 kilowatt station which is not yet in the public service, but which will shortly be utilised, by virtue of an agreement which it is hoped will be concluded shortly.

Aviation, which sooner or later will become more general, demands that an efficient wireless system shall be created for the rapid transmission of meteorological information in all parts of the country. The progress of aviation is bound up with that of wireless telegraphy.

Communication is projected between the Galapagos Islands and the continent. A station will be placed at a point on the coast which shall permit of exterior communication. All these matters are receiving consideration and the hope is felt that they will be realised.

* The information regarding these wavelengths were supplied by the Ecuador authorities, but the 1st Edition (August, 1921) Wireless Board list of radiotelegraphic waves gives them as follows:—

Guayaquil	..	2,500m., 1,400m., 800m., 300m.
Quito ..	..	3,500m., 1,400m., 800m., 300m.
Esmeraldas	..	1,800.



The stations of Quito and Guayaquil have been adapted for a system which is capable of effecting an efficient and permanent service, as apparatus exists which has recently been tested and found adequate to ensure this class of permanent service, notwithstanding the difficulties of territory and atmosphere; these questions are of great importance in view of the geographical position of the country. As the traffic develops, small stations will be established in towns of lesser importance.

The question of wireless telegraphy in Ecuador is receiving consideration from the technical and economical points of view, and on March 28th, 1921, a contract was signed with the Compagnie Générale de T.S.F. for the installation of nine wireless stations, including one for inter-continental service. This contract, it is expected, will shortly be ratified.

EGYPT

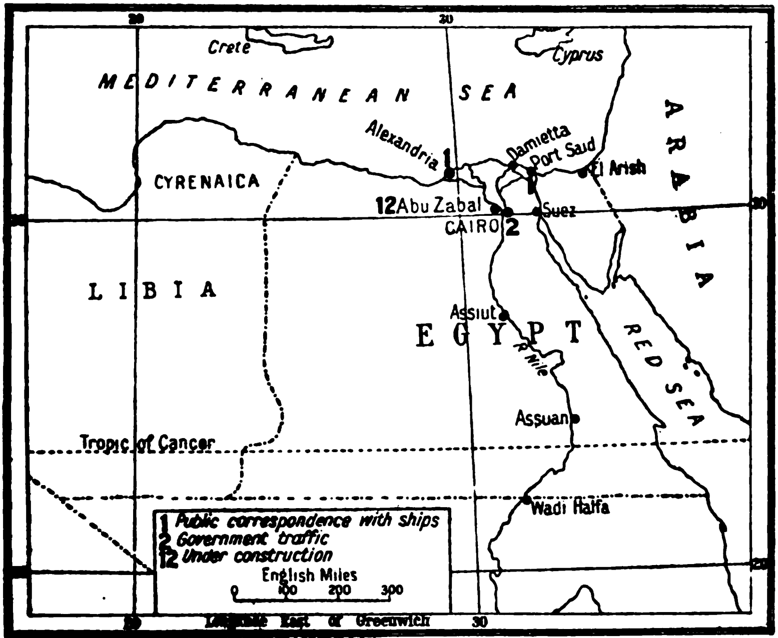
KNOWN by the Arabic-speaking peoples of the world as "Masr," Egypt was proclaimed a British Protectorate on December 18th, 1914, shortly after the declaration of war on Turkey. The inhabited portion of the country is practically wholly comprised within the valley of the Nile and its delta, a few nomadic tribes living in the large desert wastes lying to the west and east of that remarkable river. The cultivable area of Egypt is computed at about 8,006,000 feddans (a feddan is a little more than an acre).

CONTROL.

Wireless Telegraphy forms a branch of the Ministry of Communications and is controlled by the State Telegraph Department of that Ministry. The following is the position in regard to land stations:—

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. G. F. Schreiber	Inspector-General of Telegraphs and Telephones.	Cairo.
Mr. W. J. Hilyer, B.Sc., M.I.E.E., A.M.I.C.E.	Chief Engineer of Telegraphs and Telephones.	Cairo.
Mr. H. E. Watterson	Wireless Engineer	Ras el Tin, Alexandria.
Mr. L. G. Farthing	Wireless Superintendent ..	Ras el Tin, Alexandria.



The following is the position in regard to land stations: Public service to ships, Ras el Tin, Alexandria and Port Said. Abou Zabal, designed to form part of the "Imperial Chain."

ADMINISTRATION.

Wireless telegraphy is a State monopoly, in accordance with the following Khedivial Decree, dated May 12th, 1906. This power is now invested in the Ministry of Communications. (The Ministry of Communications did not exist in 1906) :—

A—Khedivial Decree.

B—Experiments in Wireless Telegraphy.

KHEDIVIAL DECREE, DATED MAY 12TH, 1906.

A 1. Wireless Telegraphy shall be a State monopoly, and no installation shall be established or used except by the Government or with the sanction of the Government.

2. The Minister of Public Works shall be responsible for the administration of this Law.

EXPERIMENTS IN WIRELESS TELEGRAPHY.

B 1. Under the Khedivial Decree, dated May 12th, 1906, Wireless Telegraphy in Egypt is a State monopoly, and the authority of the Minister of Communications is necessary before any apparatus for wireless telegraphy is installed or worked.

AUTHORITY FOR THE USE OF RECEIVING APPARATUS, CONDITIONS OF ISSUE, ETC.

2. Formal licenses to conduct experiments in wireless telegraphy cannot at present be granted, but the Minister of Communications is prepared to authorise the use of wireless apparatus for the reception of signals on the following conditions —

3. The applicant shall produce evidence of nationality and two written references as to the applicant's character. Such references should be given by persons of standing who are not related to applicant.

4. There shall be no divulgence to any person other than properly authorised officials of the Egyptian Government or a competent judicial authority or any use whatever made of any message received by means of the apparatus.

5. The installation shall be subject to the approval of the Minister of Communications.

6. The aerial wires shall not exceed the undermentioned maximum height and dimensions :—

Extreme height of aerial above ground, 30 metres.

Total length of wire including leading-in wires: 30 metres for single wire aerial; 42 metres of wire where two or more wires

are used (*e.g.*, total length 21 metres of double wire).

7. Valves shall not be used without the special authority of the Minister of Communications.

8. The apparatus shall be open to inspection at all reasonable times by properly authorised officials of the Egyptian Government..

9. An annual fee of P.T.50 shall be paid in respect of each experimental receiving license to cover the expenses of the issue of the license and the inspection of the station.

10. Authority to use wireless telegraph apparatus cannot be issued to a person under 21 years of age. Application should accordingly be made on his behalf by a parent or guardian, who should proceed as indicated above and should state his (or her) relationship to the applicant. In such cases the evidence and references specified in condition (3) should be furnished BOTH AS REGARDS THE APPLICANT AND HIS PARENT OR GUARDIAN, and the latter will be personally responsible for the carrying out of the conditions of the license.

11. The applicant should furnish (by letter addressed to the Egyptian State Telegraphs):—

(*a*) A formal acceptance of the conditions of this license, copy of which will be delivered to him against receipt.

(*b*) Evidence and references described in (3).

(*c*) His full name, age, and particulars of his occupation.

(*d*) A remittance of P.T.50.

(*e*) A description of the apparatus which it is proposed to instal, and if authority is desired for the use of valves, a diagram of the circuit in which they would be used.

(*f*) A sketch showing the form, height and dimensions of the proposed aerial wires (including leading-in wires).

(*g*) The address at which the apparatus would be installed.

12. This license is temporary and is subject to cancellation by an order of the Minister in case of breach of any of the conditions above mentioned, or at the discretion of the Minister if he deems it necessary in the general interest.

Date .

Signature of H.E. THE MINISTER.

Signature of the licensee (and his parent or guardian, if any).

ERITREA

(See ITALY.)

FALKLAND ISLANDS

THIS is a Crown Colony situated in the South Atlantic, 500 miles east of the Magellan Straits. The area covers 6,500 square miles, besides South Georgia, 1,000 square miles (estimated), and there are several dependencies —*e.g.*, the South Shetlands, South Orkneys, Sandwich Group, and Graham's Land.

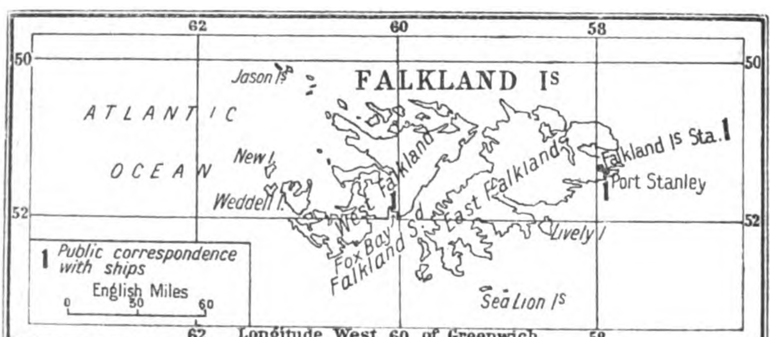
The Administration is conducted by the Governor, assisted by an Executive Council and a Legislative Council.

CONTROL.

Wireless telegraphy is under the supervision of the Post Office.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
M. Craigie-Halkett	Postmaster..	Stanley
Mr. J. Mercer	Senior Operator	Stanley
Mr. R. Campbell	Junior Operator	Stanley
Mr. T. Hooley..	Junior Operator	Stanley



ORGANISATION.

There are two wireless stations, one at Stanley Harbour, East Falkland, which belongs to and is controlled entirely by the Admiralty, the other at Fox Bay, on the East Coast of the West Island, controlled by the Public Works Department of the Colony under the ownership of the Colonial Government.

No licenses are issued for radiotelegraphic working, and no aviation stations are in existence or projected.

ADMINISTRATION.

Radiotelegraphy is administered under the following Acts :—

A—Wireless Ordinance.
B—Wireless Telegraphy Regulations.

WIRELESS ORDINANCE.

Dated March 15th, 1912.

A The following Ordinance relating to wireless telegraphy came into force on March 15th, 1912:—

1. No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any British ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor in Council.

2. No person shall work any apparatus for wireless telegraphy installed on any merchant ship (whether British or foreign) whilst that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations made in that behalf by the Governor in Council, and the Governor in Council may, by any such regulations, impose penalties, recoverable before a Stipendiary Magistrate or any two Justices of the Peace in a summary manner, for the breach of any such regulations, not exceeding twenty pounds each for offence, and may provide for the forfeiture of any such breach of any apparatus for wireless telegraphy installed or worked on such ship.

3. If any person establishes a wireless telegraph station without a license in that behalf or instals or works any apparatus for wireless telegraphy without a license in that behalf he shall be guilty of a misdemeanour and be liable on summary conviction thereof to a penalty not exceeding twenty pounds or to imprisonment not exceeding three months and, on conviction in the Supreme Court, to a fine not exceeding one hundred pounds, or to imprisonment for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license.

4. If a Justice of the Peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship within his jurisdiction without a license in that behalf or contrary to the provisions of the regulations made under this Ordinance, he may grant a search warrant to any constable or to any officer appointed in that behalf by the Governor and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place, or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy.

5. The expression "wireless telegraphy" means any communication by telegraphy without the aid of any wire connecting the points from and at which the messages or other communications are sent and received; Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

6. The Wireless Telegraph Ordinance, 1903, is hereby repealed.

7. This Ordinance may be cited as the Wireless Telegraph Ordinance, 1912.

WIRELESS TELEGRAPHY REGULATIONS.

B In pursuance of the powers in him vested by section 2 of the "Wireless Telegraphy Ordinance, 1912," His Excellency the Governor, by and with the advice of the Executive Council, is pleased to make the following Regulations :—

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of this Colony shall be worked in such a way as not to interfere with (*a*) Naval signaling, or (*b*) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the Colony, except with the special or general permission in writing of the Governor.

3. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

4. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases as may be deemed desirable.

5. The master of any merchant ship on board of which apparatus for wireless telegraphy shall be worked or used contrary to these Regulations shall on summary conviction before a stipendiary magistrate or any two justices of the peace be liable to a penalty not exceeding twenty pounds for each offence and to the forfeiture of any apparatus for wireless telegraphy installed on such ship

and in default of payment to be imprisoned with or without hard labour for a period not exceeding three months.

6. These Regulations shall come into force on the first day of September, 1912.

Dated at Government House, Stanley, this 21st day of June, 1912.

By Command,
T. A. V. Best,
Colonial Secretary.

FARÖE ISLANDS

(See Denmark.)

FIJI ISLANDS

(See map on p. 424.)

About 1,100 miles north of New Zealand lie some 200 to 250 islands (a few merely bare and uninhabited rocks), which cover a square of the South Pacific Ocean about 300 miles each way and constitute the British Colony of Fiji. Their latitude lies from 15° 45′ to 21° 10′ S.; whilst their longitude stretches from 176° 0′ E. to 178° 0′ W. The gross area of the group amounts to about 7,435 square miles.

The administration is that of a British Crown Colony, the Governor being assisted by an Executive Council of six and a Legislative Council of twenty members.

CONTROL.

The four wireless telegraph stations in Fiji are owned and worked by the Colonial Government through the department of Telegraphs and Telephones.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
C. C. F. Monckton, M.I.E.E.	Superintendent of Telegraphs and Telephones	Suva
H. P. St. Julian	Acting Superintendent of Telegraphs and Telephones	Suva
W. G. Covell, A.M.I.E.E.	Assistant Engineer	Suva
W. Kearsley R. C. Farquhar H. Roffey K. Lawry	Wireless Operators in Charge of Stations	—
L. M. Browne A. O. Barrack K. W. A. Black W. G. Ragg	Wireless Operators	—
T. J. Davis	Accountant	Suva

Stations.—Suvaradio, Labasaradio, Taviuniradio, and Savusavuradio.

It is anticipated that a wireless telegraph station will be erected at Loma Loma during the present year.

There are no aviation or ship stations licensed in Fiji. Licenses have recently been granted for privately owned experimental stations to two members of the Fiji Defence Force, one situated at Lautoka, the other at Sigatoka. The colony possesses no wireless clubs or societies.

ORGANISATION.

The first Wireless Telegraph Ordinance was passed in 1903. This was revoked by Ordinance No. XXV of 1912 (printed in the Year Book for 1917), which was in turn revoked by Ordinance V of 1913. New regulations were made in 1917, which have since been revoked, and the original regulations made in 1913 are now in force.

No licenses for wireless telegraph working have been issued since 1914. There are no stations existing or projected for aviation or meteorological purposes.

ADMINISTRATION.

The following pages contain the text of :—

A—Ordinance No. V of 1913.
B—Schedule based thereon.
C—Form of Experiment License.

AN ORDINANCE TO PROVIDE FOR THE REGULATION OF WIRELESS TELEGRAPHY.
Dated June 19th, 1913.

A Be it enacted by the Governor with the advice and consent of the Legislative Council as follows :—

1. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1913.

2. In this Ordinance "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received : Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under or in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such purpose as the Governor may determine and shall contain the terms conditions and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship whether British or foreign while that ship is in the territorial waters of the Colony otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this ordinance and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a stipendiary magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under this Ordinance be may grant a search warrant to any officer of constabulary or any person appointed in that behalf by the Inspector-General of Constabulary and named in the warrant and a warrant so granted shall authorise the officer of constabulary or person named therein to enter and inspect the station place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds and upon such conviction the court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before a stipendiary magistrate on the complaint of the Inspector-General of Constabulary or of any person thereto authorised by him in writing and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphy Ordinance 1912 is hereby repealed.

Passed in Council this twenty-sixth day o May in the year of our Lord one thousand nine hundred and thirteen.

SCHEDULE.

REGULATIONS.

B (i) All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with :—

(*a*) Naval signalling ; or
(*b*) the working of any wireless telegraph station lawfully established installed or worked in the Colony or the territorial waters thereof and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(ii) In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station whether on shore or on any ship.

(iii) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

(iv) For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(v) Any summons or other document in any proceedings under these regulations shall

be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

(vi) These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

License to use Wireless Telegraphy for Experimental Purposes, granted by the Governor in pursuance of Section 3 of Ordinance No. V of 1913.

C License is hereby granted to of (hereinafter called the licensee), subject to the conditions hereinafter contained during the term or period commencing on the and terminating on the day of

(i) to establish, instal and work at the station specified in the Schedule hereto apparatus for wireless telegraphy (hereinafter called "the licensed apparatus") provided that the apparatus installed at such station shall be of the character specified in the said Schedule opposite to the name of such station; and

(ii) to transmit and receive messages by means of wireless telegraphy at the said stations.

Provided that the licensed apparatus shall be worked and the messages shall be transmitted and received solely for the purpose of conducting experiments in wireless telegraphy and for no other purpose whatever.

2. The licensed apparatus shall not be used by the licensee or by any other person either on his behalf or by his permission for any purpose except for the purpose of conducting experiments in wireless telegraphy.

3. (1) The licensed apparatus shall be so worked as not to interfere with the working of any wireless telegraph station established in the Colony of Fiji or the territorial waters abutting on the coasts of the Fiji Islands by or for the purpose of the Government of Fiji or any department of His Majesty's Government or for commercial purposes and in particular with the transmission or receipt of any messages between or at wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the licensee and any person acting on his behalf or by his permission shall comply with all directions which shall be given to the licensee by the Colonial Secretary or prescribed by the Colonial Secretary with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not without the consent in writing of the Colonial Secretary be altered in respect of any of the particulars mentioned in the Schedule hereto.

(4) The licensee shall at all times indemnify the Government against all actions, claims and demands which may be brought or made by any corporation, company, or person in respect of any injury arising from any act, licensed or permitted, by these presents.

4. (1) The licensee shall not (either by himself or by any person acting on his behalf or by his permission) by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus, interfere with naval signalling.

(2) Whenever the operators at any of the said stations of the licensee perceive through the medium of the instruments used by them that naval signalling is proceeding, they shall refrain from using the licensed apparatus until all indication that naval signalling is proceeding shall have ceased.

(3) The licensee and any person acting on his behalf or by his permission shall, if so required, in writing by the Colonial Secretary cease to use the licensed apparatus for such period (not exceeding....hours in any one day) as may be specified by the Admiralty.

(4) If the Governor is of opinion that the working of the licensed apparatus at any station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall when required in writing by the Colonial Secretary close the said station.

(5) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this Indenture.

5. Neither the licensee nor any person on his behalf or by his permission shall divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee or any such person as aforesaid and transmitted by naval signalling or by any system of wireless telegraphy provided or maintained by or for the purpose of the Government of Fiji, or by any licensee of the Colonial Secretary (other than the licensee).

6. The Superintendent of Telegraphs and Telephones and his engineers, agents and assistants may, from time to time, and at all reasonable times, enter upon or any of the stations or other premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such places respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively, and the working and user of such apparatus and telegraphic instruments respectively, and the licensee shall afford all requisite and proper facilities for such inspection and shall secure to the said Superintendent the right for the purpose aforesaid of entry from time to time and on such of the said stations and premises as may be in the possession or occupation of any person or persons other than the licensee.

7. (1) All apparatus used or intended to be used under this license shall be so erected, fixed, placed and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance, working or user of any telegraphic line of the Government which may from time to time exist or which it is probable that the Government may have occasion to erect, place, fix or use or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or user thereof.

(2) In case any telegraphic line of the Government shall be damaged or the efficient working or user thereof shall be wholly or partially interrupted or otherwise interfered with and the Superintendent of Telegraphs and Telephones for the time being shall

certify in writing under his hand that such damage, interruption or interference has been caused directly or indirectly by any apparatus used or intended to be used under this licence or by anything done by on behalf or with the permission of the licensee in relation thereto the licensee shall on demand pay to the Colonial Secretary all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraphic line so as to restore the same to efficient working order, and in adding thereto or substituting therefor either temporarily or permanently any other telegraphic line if the said engineer shall certify that such addition or substitution is reasonably required.

8. Except with the consent in writing of the Colonial Secretary the licensee shall not assign, underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licenses, powers or authorities hereby granted or any of such licenses powers or authorities.

9. If and whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the Governor by warrant under his hand to direct and cause so much of the licensed apparatus as is within the Colony of Fiji or the territorial waters thereof or any part of the licensed apparatus to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any person authorised by the Governor may enter upon stations specified in the Schedule hereto or any of them and take possession thereof and use the same as aforesaid.

10. The Colonial Secretary may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Colonial Secretary under any convenant or provision herein contained on the part of the licensee to be observed and performed.

11. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the covenants or conditions herein contained and on the part of the licensee to be observed and performed the Colonial Secretary may in writing revoke and determine those presents and the licensed powers and authorities hereinbefore granted and each and every of them, and thereupon these presents and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

Provided always that no such revocation or determination as aforesaid shall prejudice or affect any right of action or remedy which shall have accrued or shall thereafter accrue to either of the parties hereto under the covenants herein contained.

12. Nothing in these presents shall prejudice or affect the right of the Governor from time to time to establish, extend, maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Governor from time to time to enter into agreement for or to grant licenses relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the Colony of Fiji by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit.

13. Any notice, request or consent (whether expressed to be in writing or not) to be given to the licensee under these presents may be served by sending the same by registered letter addressed to the licensee and any notice to be given by the licensee under these presents may be served by sending the same by registered letter addressed to the Colonial Secretary.

By Command,

Colonial Secretary.

Given under my hand this day of

THE SCHEDULE BEFORE REFERRED TO:

Name of Station.	Character of Apparatus.		
	Maximum range of signalling with the Licensee's	Power (Current and Voltage).	Source of Power.

FINLAND

(See map on page 418.)

THE independence of Finland was proclaimed during the Russian revolution and a Republic set up, adopting the new Constitution in 1919. It is bounded on the North by Norway, the West by Sweden and the Gulf of Bothnia, the South by the Gulf of Finland, and includes a large part of Lapland. It has an area of 125,689 square miles and a population of 3,155,000.

Radiotelegraphy and telephony is under the administration of the Ministry of War.

We have not been able to obtain any up-to-date information regarding wireless telegraphy and telephony in this country, but hope to include full details in our next Edition.

FORMOSA

(See JAPAN.)

FRANCE

(Including Algeria and Tunis.)

(*For other Colonies of France, see page* 268.)

FRANCE is the most westerly of Central European countries. In latitude it lies between 40° 29′ and 51° 5′ N.; in longitude between 7° 45′ E. and 4° 45′ W. The area of its 87 departments (including the Isle of Corsica) is estimated at 207,076 square miles.

Its colonial possessions (including Algeria and Tunis) cover a total area of 4,084,410 square miles. Of these Algeria (French since 1830) is reckoned as an integral part of France, the rest being governed as protectorates. Tunis has been a French Protectorate since 1881. The area of French Africa alone is reckoned at 3,812,000 square miles.

CONTROL.

Radiotelegraphy in France is a State monopoly.

The commercial use of wireless telegraphy in France, Algeria and Tunis has been placed under the control of the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs. The Department of Telegraphs deals with all matters relating to the administration of commercial wireless telegraphy, and this Department also controls inland and foreign telegraphs. The Ministry of War and the Ministry of Marine control the use of wireless telegraphy in the Army and Navy respectively.

As far as the large high-power radiotelegraph stations of France are concerned they are under the jurisdiction of different Government Departments, as follows:—

Eiffel Tower ..	..Ministry of War.
Basse-Lande (Nantes)	..Ministry of Marine.
La Doua (Lyons) .. Croix d'Hins (Bordeaux)	These two stations, erected by the War Department, are worked by the Administration of Posts and Telegraphs, for Public Service, and in principle for communication with the stations of the French Inter-Colonial districts.

A large high power station is under consideration by the authorities. It will be situated at Pézenas.

With regard to the other French Colonies, the service in each is organised under a decree of the respective Governors of those Colonies. We append a general note affecting radiotelegraphy in these Colonies, which will be found at the end of this section.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
M. le Capt. de Vaisseau Lagorio ..	Directeur du Service de la Télégraphie sans Fil	5 rue Froideveaux Paris (14 éme)
M. Perrin	Ingénieur au Service de la Télégraphie sans Fil	do.
M. Hamel	do.	do.
M. le Corbeiller	do.	do.
M. Veaux	do.	do.
M. Reynaud..	Inspecteur au Service de la Télégraphie sans Fil	do.
M. Lereconvreaux	do.	do.
M. Santoni	do.	do.

ORGANISATION.

Since June 5th, 1919, commercial traffic has been reopened with Budapest and Belgrade through the Eiffel Tower; with the United States of America a provisional service has been established between the stations of Lyons and Annapolis. The Lyons Station also communicates with Rufisque (French West Africa) and Brazzaville (French Equatorial Africa).

ADMINISTRATION.

Licenses for the erection and maintenance of ship stations are issued to steamship companies. The form of such licenses and the contract indicating the conditions under which is accorded authorisation to instal wireless telegraphy on board ships will be found below.

The administration of radiotelegraphy is governed by the following enactments, supplemented by a Form of Ship's License :—

A—Decree, dated March 5th, 1907 (modified by subsequent enactments).
B—Decree, dated February 24th, 1917.
C—Decree, dated December 15th, 1917 (modified by Decrees of May 15th, 1919, and March 21st, 1920).
D—Form of Ship's License.
E—Law of July 31st, 1919.
F—Administrative Order, dated February 27th, 1920, regulating Wireless Time and Meteorological Signals.
G—Law of August 9th, 1920.
H—Decree of August 26th, 1920.
I—Decree of May 15th, 1921, modifying Articles 3 and 4 of the Decree of February 24th, 1917.
J—Law of June 18th, 1921, Licenses for experimental, etc., stations.

A The following is the Decree dated March 5th, 1907 (modified and completed by the following decrees): April 26th, 1910; February 5th, 1911; May 27th, 1911; November 20th, 1911; July 31st, 1919, which superseded the decrees of February, 1903, and February 27th, 1904 :—

ART. 1.—All wireless telegraph stations in France, in Algeria and in the Colonies are in times of peace worked by the Administration of Posts and Telegraphs with the exception of :—

(*a*) Coast stations communicating with warships and naval establishments ashore.

(*b*) Stations on military territory, or engaged solely on military work.

(*c*) Stations which are purely military in character and which in times of peace are only occupied in periodically exchanging practice telegrams.

(*d*) Special stations on lighthouses and buoys.

(*e*) Stations erected for internal communication, either within the boundaries of any one territory, or to communicate between two neighbouring territories, two groups of neighbouring territories, and a colony, or a group of colonies, with a neighbouring foreign country always providing, of course, that for other than local communication (which would be exceptionally allowed).

Questions of contract and tariff would be regulated between the departments concerned (Ministry of the Colonies), Administration of Posts and Telegraphs and, if existing, Ministry of Foreign Affairs.

Any deviation from this rule will form the subject of discussion between the Ministries concerned.

ART. 2.—In the event of mobilisation all radiotelegraphic stations, without exception automatically fall under the authority of the Ministries of War and of the Navy.

In case of mobilisation the Ministries of Marine and War shall automatically assume control of all stations, without exception.

3. The choice of sites for the proposed range of a station and all technical conditions applicable to each projected station shall be submitted for the consideration of an Inter-ministerial Commission formed in accordance with Article 4 of this Decree. The function of this Commission is to study the various aspects of the services to be carried on and to indicate to the Administrative Departments affected the conditions that are necessary to reconcile their respective interests.

4. The Inter-ministerial Commission shall be appointed by the Minister of Public Works, Posts and Telegraphs, and shall comprise the following members :—

One President and one Vice-President appointed by Presidential decree from the Departments interested.

Three representatives from the Ministry of Marine.

Three representatives from the Ministry of War.

Two representatives from the Colonial Office.

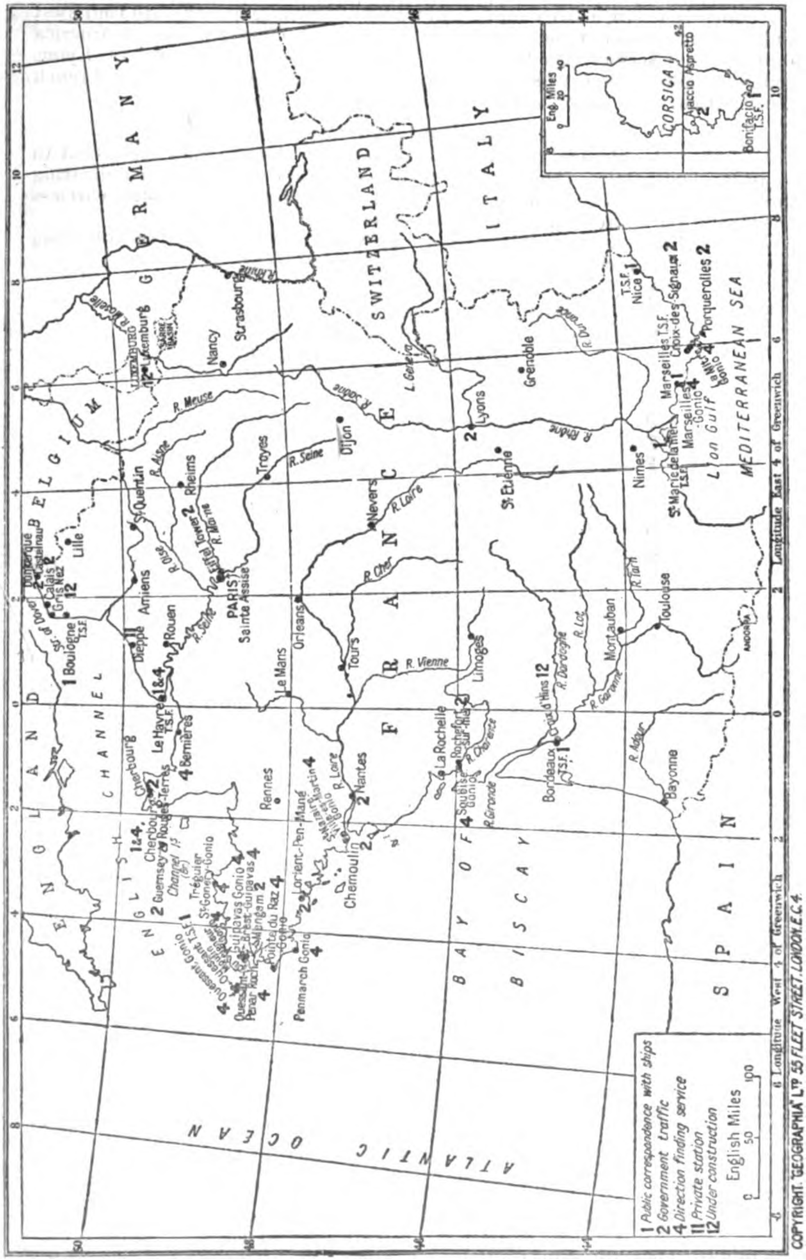
One representative from the Foreign Office.

One representative from the Ministry of Commerce and Industry.

Four representatives from the Ministry of Public Works.

Three representatives from the Administration of Posts and Telegraphs.

A secretary who shall belong to the Post



ENGLAND
GERMANY
BELGIUM
SWITZERLAND
ITALY
FRANCE
SPAIN
ENGLISH CHANNEL
BAY OF BISCAY
ATLANTIC OCEAN
MEDITERRANEAN SEA
CORSICA I.
PARIS
Sainte Assise
Eiffel Tower 2
1 Public correspondence with ships
2 Government traffic
4 Direction finding service
11 Private station
12 Under construction
English Miles
0 50 100
Longitude West of Greenwich
Longitude East of Greenwich
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and Telegraph Administration. He shall have no voting powers.

5. The Commission shall examine the title to sites and technical conditions appertaining to all stations which shall constitute the French radiotelegraphic network; examine complaints regarding French stations; consider such administrative problems concerning the radiotelegraphic service as the Ministry of Public Works, Posts and Telegraphs deems fit to submit to it; institute experiments of general interest. The Commission shall be informed through the departments represented thereon of results obtained by various types of apparatus employed at stations in operation.

6. Exclusive of the periods of mobilisation stations established, kept up, and worked by Administrations other than that of Posts and Telegraphs may be open to public service in agreement with this Administration.

7. The Post and Telegraph Administration shall be responsible for all matters concerning the collection and taxes, foreign stations, and the International Bureau at Berne. It shall supervise the administration of international regulations in so far as they concern commercial traffic passing through coast stations in France, Algeria and Tunis, as well as through stations on vessels of the mercantile marine.

8. Licenses to establish private stations shall be granted by the Post and Telegraph administration upon the recommendation of the Commisison referred to in Article 4. Such licenses shall only be of a temporary character and the stations are strictly forbidden to interfere with the working of other stations.

9. Cost of experiments carried out on the demand of the Commission are regulated by special credit, negotiated through the budget of the Administration of Posts and Telegraphs.

10. The Ministers of Public Works, of Posts and Telegraphs, of War, of Marine, of Colonies and Foreign Affairs are charged in so far as concerns their respective departments, with the carrying out of this decree.

11. The provisions of the decree of February 7th, 1903, and of the decree of February 27th, 1904, are abrogated.

12. The provisions of Articles 2, 3, 5, 6, 7, and 8 are not applicable to the Colonies as far as local stations, as defined in Paragraph (*e*) of the 1st Article, are concerned.

The organisation of these stations, in the event of mobilisation, is regulated by Governors General and Governors in agreement with the Departments of War, of the Navy and of Colonies.

The personnel of the Administration of Posts and Telegraphs attached in any Colony to an Inter-Colonial Wireless Telegraph Station, not falling under one of the headings specified in Paragraph 5 of the 1st Article receives its working instructions from the Metropolitan Administration of Posts and Telegraphs.

These instructions are transmitted to it through the intermediary of the Administrative Authority of the Colony, except in case of urgency, and on condition that this authority is advised of them with as little delay as possible.

This personnel is placed, in regard to general discipline, under the surveillance and the authority of the high functionary who administers the territory in which is located the station. This high functionary gives to the supervised personnel annual notes, a record of which is kept in connection with their advancement.

Modifications other than those connected with the material of the stations, questions concerning the working and general organisation of the service are regulated in agreement with the Metropolitan Administration of Posts and Telegraphs and the Colony.

Colonial Military Stations are under the supreme authority of the respective Governors.

B Decree of February 24th, 1917, relating to the reception and transmission of radiotelegraphic signals.

Art. 1.—Private individuals and corporations are forbidden to establish or make use of telegraphic machinery, or apparatus, or any fitments whatsoever capable of transmitting or receiving signals, without the express authorisation of the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs either on French territory or above that territory, or on board French vessels.

The employment on board foreign vessels in French territorial waters of wireless apparatus or installations, is forbidden, except in conformity with the rules laid down by the French Government for the employment of such apparatus and installations in the aforesaid territorial waters.

Art. 2.—Authorisation for the establishment of a transmitting radiotelegraphic station is only granted to private individuals, or corporations, under the proviso that no let or hindrance shall be able to arise therefrom to the detriment of the working of public stations. The Minister, whenever he shall think fit to authorise (after consultation with the Ministers of War and Marine) the establishment of any proposed station, shall lay down the conditions under which that station shall be erected and worked.

Art. 3.—Receiving wireless stations require the same authorisation, under the same conditions as transmitting stations.

It is understood, however, that stations destined for the reception of time and weather signals, whose erection is sought by French citizens, may receive due authorisation by the head of the local Postal and Telegraphic Service (when the latter is asked to do so by the parties interested) under the conditions laid down by a Decree of the Minister for Commerce, Industry, Agriculture, Labour, Posts and Telegraphs (after consultation with the Ministers of War and Marine). Special measures may be carried out under the authority of the Ministers of War and Marine in view of the concession in favour of stations of the kind above mentioned in certain stated districts.

Art. 4.—The royalties due from those who have been granted leave to erect stations are fixed by the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs and worked in consultation with the Minister of Finance.

Stations for the reception of time and weather signals shall be only liable to payment of a fixed royalty of five francs per year per station.

Art. 5.—In times of war—

(*a*) All private wireless stations, with the exception of those used by, or on behalf of, military authorities must be dismantled. The owners of such stations must remove the antennæ, and deposit the essential parts of their sending and receiving apparatus in places designated for that purpose by the Postal and Telegraphic authorities.

(*b*) The antennæ of wireless stations of mercantile vessels must be dismantled during

the whole of the stay of such vessels in French ports and/or territorial waters, unless they have received special authorisation not to do so from the Naval Authority. Moreover, the Marconi Cabin must be locked up and the key placed in the hands of the master of the vessel. No work (either in the way of overhaul, repair, etc.) may be executed unless the aforementioned officer has assured himself that the work is being carried out by persons authorised to do so.

(*c*) It is within the option of the Minister of Commerce, Industry, Agriculture, Labour, Posts and Telegraphs (acting after consultation with the Minister of War and Marine), to prohibit for the time being all manufacture, vending or sale of radiotelegraphic apparatus, except under special licence.

ART. 6.—The rules laid down under Chapter V of the Decree-Law dated December 27th, 1851, are applicable to the conditions laid down by the present Decree.

In times of war any representative of the Minister of War, or the Minister of Marine shall be qualified equally with the Minister himself to institute the proceedings provided for in Art. 10 of the aforesaid Decree-Law.

Moreover, in times of war the War Office and Admiralty shall also have power to take the provisionary measures laid down in Art. 12 of the Decree-Law of December 27th, 1851, if in their opinion such measures are matters of urgency.

Statements drawn up by officers of the French Forces, either on land or sea shall not require to be taken on oath. They are to be viewed as absolutely reliable unless the contrary shall have been proven.

C Decree of December 15th, 1917 (as modified by Decrees of May 15th, 1919, and March 21st, 1920).

ART. 1.—The Ministers of Commerce, of Industry, of Posts and Telegraphs have appointed an Extra Parliamentary Committee charged :—

(1) With the centralisation and examination of all general questions concerning the establishment of radiotelegraphic services and the exploitation of Inland, Inter-Colonial and International Wireless Telegraphy with the exception of the following :—

(*a*) The Military and Naval Organisation of the Inter-Allied Services established purely for Military or Naval purposes.

(*b*) Colonial services organised to ensure internal communications in any particular colony, or between two neighbouring colonies, two neighbouring groups of colonies, and a colony, or a group of colonies with neighbouring foreign countries.

(2) As a result of this examination to prepare on broad lines legislative, or administrative, regulations to be brought into force as soon as possible after the cessation of hostilities, the National Organisation of the Radiotelegraph Service which forms a part of the General Telegraph Service without infringing Art. 2 of the Decree of March 5th, 1907.

ART. 2.—This Commission will be composed as follows :—

Four members of the Senate.

Eight members of the Chamber of Deputies.

Seven representatives of the Ministry of Public Works, *i.e.* :

(*a*) Four representatives of the Administration of Posts, Telegraphs and Telephones.

(*b*) One representative of the Services of Harbours, of the Mercantile Marine and of Fisheries.

(*c*) One representative of the Service of Lighthouses and Buoys.

(*d*) One representative of the Services of Civil Aeronautics and Aerial Transport.

Three representatives of the Ministry of War.

Three representatives of the Ministry of Marine.

Three representatives of the Ministry of Colonies.

One representative of the President of the Council.

One representative of the Ministry of Foreign Affairs.

One representative of the Ministry of the Interior (service of public safety).

One representative of the Ministry of Public Instruction.

One representative of the Ministry of Finance.

Two representatives of the Radioelectrical Industry.

One representative of the Staff of the Wireless Service of the Mercantile Marine.

ART. 3.—The Commission formed under the present Decree will be presided over by the Under-Secretary of State for Posts and Telegraphs, assisted by two Vice-Presidents chosen from amongst the Members of Parliament.

ART. 4.—The Members of the Commission will be nominated by a Decree based on the report of the Minister of Posts and Telegraphs, of the Minister of War, of the Minister of Marine, and of the Colonial Minister, after the Head of each of the other Administrations mentioned in Art. 2 above shall have named their representatives to the Minister of Posts and Telegraphs.

ART. 5.—The active Members of the Commission who are bound to be present at a meeting may absent themselves on condition that their place is taken by a member of their same service who will represent them with votive powers.

ART. 6.—All previous regulations on this subject are hereby abrogated.

ART. 7.—The President of the Council, the Minister of War, and the other Ministers interested are charged, in so far as concerns their respective departments, with the carrying out of thie decree, which will be published in the *Journal Official* and inserted in the *Bulletin des Lois*.

FORM OF SHIP'S LICENSE.

FRENCH REPUBLIC.

D MINISTRY OF COMMERCE AND INDUSTRY, POSTS AND TELEGRAPHS.

Office of Control, Telegraphic Administration.

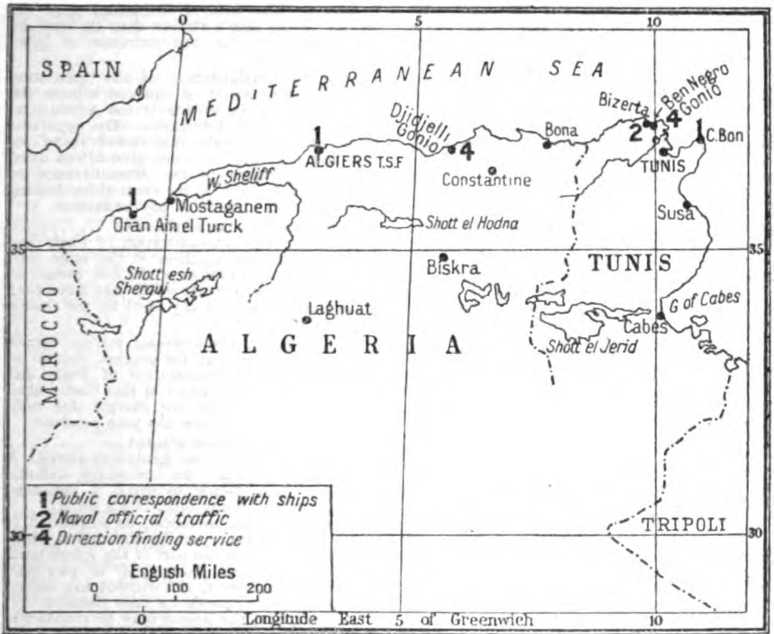
License delivered in accordance with Article IX of the International Radiotelegraphic Convention Service Regulations.

In consideration of the undertaking given by the applicant and the particulars furnished by.......................

And in consideration of the arrangements under the Convention and the Radiotelegraphic Regulations as codified in London on July 5th, 1913; and especially of Articles III, VII, VIII, X, XI, XIII, and XVI of the aforesaid Regulations.

And in consideration of the report supplied by the Engineer-in-Charge of the Radiotelegraphic Service following on his visit to the station on board ....

Authorisation is hereto given for the instalment and maintenance of the radiotelegraphic station on board the .... which is scheduled under Class ....



The present license is available for as long as the Radiotelegraphic Convention and Regulations of London remain in force.

Given in Paris on the .... day of ....

(Signed) on behalf of the Minister of Commerce, Industry, Posts and Telegraphs by

....

Chief of the Telegraphic Administration.

UNDERTAKING

GIVEN BY ....

Who in consideration of an authorisation to instal and maintain a wireless telegraph station on board the s.s. .... declares himself willing to submit, without reserve, to the clauses and conditions of the agreement whereof the text is herewith subjoined, with the object of obtaining such authorisation for utilising a wireless station on board the s.s. ....

ART. 1.—The installation of the proposed wireless station shall be submitted to the preliminary approval of the Administration of Posts and Telegraphs. Only apparatus manufactured in France, from materials supplied by builders or manufacturers having their workshops in France, can be employed in the construction of this radiotelegraphic station.

The average range of the station shall be ....

In the event of its being recognised—in consequence of improvements carried out in radiotelegraphy (affecting range, syntony, wave direction, etc.)—that important modifications can be adopted in the ship's station, the Administration of Posts and Telegraphs reserves to itself the right of providing for the adoption of such improvements.

Every subsequent alteration made to the station must be notified to the Administration of Posts and Telegraphs and receive official approval before its inception.

ART. 2.—................ shall take every care necessary to ensure that the installation, maintenance, and usage of the station, as well as any modifications introduced in accordance with the preceding article, shall be carried out without involving any expense to the Administration of Posts and Telegraphs.

ART. 3.—All contracts, agreements, etc., which have been entered into, or which shall in the future be entered into, between .... and the manufacturers of wireless apparatus, or which have been or shall be made with wireless companies, for the construction and maintenance of the station, shall—before being put into effect—be submitted for the approval of the Administration of Posts and Telegraphs.

ART. 4.—A charge in favour of the ship's station may be levied on the aforementioned vessel; its amount being fixed by the Administration of Posts and Telegraphs in agreement with .... This charge shall not be made on official communications of the French Republic.

.... shall be liable to be called upon to place in an office of the Posts and Telegraphs a deposit, by way of guarantee for the charges received on board, and for which he is accountable to the Administration of Posts and Telegraphs.

In the event of the administration of the authorised station being granted to a company, ... shall remain responsible for the charges received on board.

Art. 5.—All telegraphists entrusted with the manipulation of apparatus must be of French nationality, and subject to the approval of the Administration of Posts and Telegraphs.

Art. 6.—The contents of telegrams transmitted by wireless, which reach the ship's station without being intended for .... shall not be divulged to any one whatsoever outside the officials appointed by the Administration of Posts and Telegraphs, or the competent officers of judicial police. No use whatsoever may be made thereof.

Art. 7.—The Administration of Posts and Telegraphs may, if it seems good to them, demand at any moment, and on immediate requisition, that the station on board shall be temporarily, or permanently, taken over by State officials. These officials shall be accommodated on board in the class corresponding to their grade. Their messing may be charged for, but not their transport. In such cases the Administration of Posts and Telegraphs shall render account to .... for the board ship charges due to him after making deduction of cost of upkeep of the station.

In the event of the Administration of Posts and Telegraphs deciding to apply the foregoing provision they may employ wireless telegraphic apparatus of a different type to that utilised by .... They reserve, moreover, the right, in case of need, of placing such apparatus on board in advance.

Art. 8.—The Administration of Posts and Telegraphs shall exercise in the manner which seems best to them their right of control over the authorised ship's station (installation, transmission, and reception of radiograms, rendering of accounts, etc.).

Art. 9.—The date of the initiation of the service of the ship's station shall be fixed by agreement with the Administration of Posts and Telegraphs.

After the establishment of the installation the apparatus cannot be removed without the express consent in writing of the Administration of Posts and Telegraphs. The apparatus must be continuously maintained ready for use, and .... must give fifteen days' notice in advance to the Administration of Posts and Telegraphs in the event of his desiring for any reason to cease to use the station.

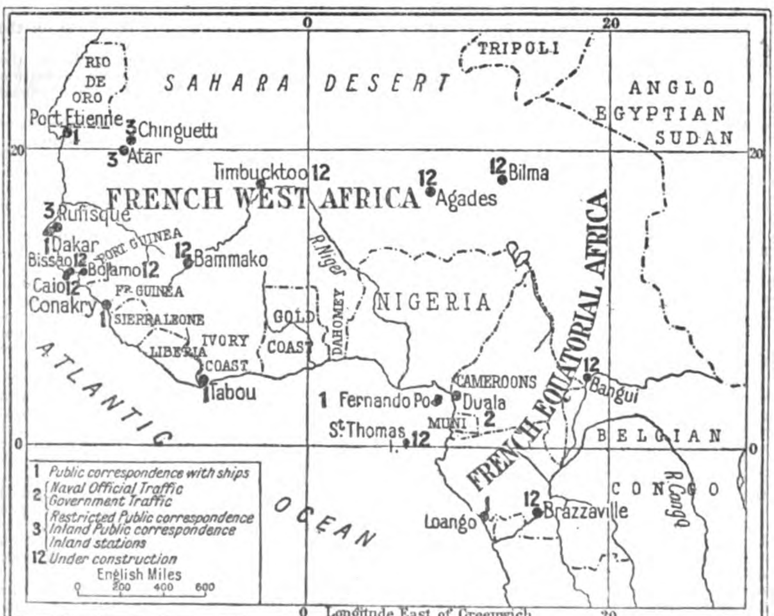
In the event of the ship's sale, ... must advise the Administration of Posts and Telegraphs, informing them at the same time of the name and address of the new owner, as well of the arrangements which may have been made (should there be any such) for the closing of the station.

In any event, the aforesaid station cannot be closed down without the express consent in writing of the Administration of Posts and Telegraphs, and the holder of this license shall remain responsible for the charges due until authorisation for transfer has been received.

Art. 10.—The license granted to .... applies only to the vessel mentioned above. A new license would be necessary, should .... decide to instal a radiotelegraphic station on any other of his ships.

This license can, moreover, be suspended or revoked at any time, and for any reason, without any liability on the part of the Administration of Posts and Telegraphs to pay any indemnity whatsoever, and without any obligation to state the reasons for their decision.

In particular, the license may be revoked in



the event of failure by .... to observe the provisions of the present agreement.

ART. 11.—.............. declares that he subscribes to all the legislative arrangements and rules established, or that shall in the future be established, in France with regard to internal and international wireless service.

The wireless station which forms the subject of this license shall exchange radiotelegrams with all the coast or ship stations within the sphere of action of which it shall come without any distinction of the radiotelegraphic system adopted by these stations.

ART. 12.—The State shall not be subject to any responsibility through difficulties which may arise between .... and private individuals, companies or corporations, to whom authorisation for carrying on wireless telegraph stations may have been granted; or in general with anyone soever or for any reason.

ART. 13.—The stamp duties appertaining to the present license are payable by ....

Given on .... the ....
day of ....

LAW OF JULY 31ST, 1919.

E

The President of the Council; the Minister of War; the Minister of Marine; the Minister of Public Works, of Transports and of the Mercantile Marine; the Minister of Commerce, of Industries, of Posts and Telegraphs; the Minister of Colonies, having seen the Decree of March 5th, 1907,

Hereby decree:—

ART. 1.—Radiotelegraph Stations joining departments other than the departments of War and of Marine are in times of peace, in view of their utilisation in war time, under the control of a special commission instituted by the Minister of War (General Staff of the Army).

ART. 2.—The Commission is presided over by one of the sub-heads of the General Staff of the Army and comprises a representative of each of the following Ministries: Marine, War, Public Works, and Colonies, as well as of the Administration of Posts and Telegraphs.

These representatives, who are nominally elected by the Administrations which they serve, are in principle the Directors of the Wireless Service in their respective administrations.

Each has an assistant, also nominally elected, and with authority to take the place of the former in case of absence.

An officer of the General Staff of the Army carries out the functions of Secretary, with voting powers.

ART. 3.—The Commission will give its advice on all questions relative to the best means of utilising Radiotelegraph Stations, both fixed and portable in time of war.

It will especially occupy itself with the control of mobilisation of Non-Military Wireless Telegraph Stations, and to investigate experiments of every kind made to improve the utility of wireless in time of war of Non-Military Stations as suggested by the different Ministerial Departments.

ART. 4.—At least once a year, and more often if necessary, the Commission will overhaul Non-Military Stations and their technical equipment, and will also test the professional knowledge of the personnel. Each overhaul will be made by a representative of the Administration working the station and by a representative of the Ministry of War or of the Ministry of Marine according as to whether the station falls under the authority of the one or the other.

The Commission chooses those of its members who will undertake the overhaul, or will ask the departments interested to make the necessary selection from their personnel.

A *procès-verbal* will be prepared after each overhaul and forwarded to the Commission.

ART. 5.—The Commission will transmit its reports and the *procès-verbaux* of its sittings to the Ministers concerned through their representatives. The Ministers will take what steps are necessary in view of these communications.

ART. 6.—In the Colonies the overhaul on Non-Military Stations and of their technical equipment as also that of the professional knowledge of the personnel is carried out according to rules formulated under Articles 3 and 4, by representatives of the departments concerned who are chosen by the Governors-General or Governors.

Reports are transmitted by these High Functionaries to the Department of the Colonies. The latter formulates, if necessary, its observations or propositions.

UNDER SECRETARIATE OF STATE FOR POSTS, TELEGRAPHS AND TELEPHONES.

F

ADMINISTRATIVE ORDER OF FEBRUARY 27TH, 1920, REGULATING THE CONCESSION OF WIRELESS TELEGRAPH TIME AND METEOROLOGICAL STATIONS.

The Under-Secretary of State for Posts and Telegraphs, having seen the decree of February 24th, 1917, and in accordance with the advice of the Minister of War and of the Minister of Marine, on the proposal of the Director of the exploitation of Telegraphs,

Enacts:—

The conditions regulating the establishment and use, by private persons, of radiotelegraph stations intended solely for the reception of time signals and meteorological telegrams are fixed as follows:—

ART. 1.—Applications for authorisation must be addressed to the Director of Posts and Telegraphs of the department in which the station is to be installed.

Applicants must indicate the precise place where the station will operate and must furnish a description of the apparatus utilised. They must, if necessary, furnish evidence as to their French nationality.

ART. 2.—Authorisation is granted:—

(*a*) By the Director of Posts and Telegraphs concerned, when the applicant is of French nationality.

(*b*) By the Under-Secretary of Posts and Telegraphs to whom the application shall have been forwarded by the Director who will express his opinion, if the applicant be a foreign subject.

Authorisation is moreover subordinated to the opinion of the military authorities (General Commanding the Army Corps) to whose jurisdiction the place in question is subject when the station for which the concession is sought is situated at a point 50 kilometres or less distant from the land frontiers, and to the opinion of the Maritime Authorities (Maritime Prefect) to which the place is subject when the station is situated at a point 50 kilometres or less distant from the maritime frontiers.

ART. 3.—The receiving stations referred to in Article 1 cannot be used for purposes other than the reception of time signals and meteorological telegrams. Any transmission of signals is formally forbidden.

Art. 4.—The contents of radiotelegrams other than meteorological telegrams which might be received by the receiving stations authorised must not be published or divulged to any person whatever excepting to the officials designated by the Administration of Posts and Telegraphs or to the competent officers of the judiciary police. No use shall be made of such telegrams.

Art. 5.—The Administration of Posts and Telegraphs reserves the right to exercise over receiving stations authorised any control that it may deem fit.

Art. 6.—The State shall not be under any responsibility by reason of the utilisation of the wireless telegraph receiving stations for which a concession may have been granted.

Art. 7.—The concessionaries are bound to notify the Directors of Posts and Telegraphs of any change that they propose to make in the installation of their stations.

The Administration of Posts and Telegraphs may, moreover, at any ti ne and for any cause whatever, suspend or revoke the authorisations granted without being called upon to pay any indemnity or to reveal the reasons for its decision.

These authorisations do not carry any privilege and cannot impose any obstacle to the subsequent granting of authorisations of the same character to any other applicant. They cannot be transferred to third parties without the express and written authorisation of the Administration of Posts and Telegrapns.

At the first request of the Administration of Posts and Telegraphs every concessionary shall immediately put his station out of working order.

Art. 8.—The concessionary shall submit to all the regulationary of fiscal provisions resulting from the laws, decrees or regulations which might subsequently intervene as regards the establishment or use of wireless telegraph stations.

Art. 9.—The concessionary shall pay a statistical tax fixed at five francs per year and for each station authorised. This royalty is due for the whole year.

Art. 10.—The stamp dues applicable to documents relative to the authorisation of time stations shall be borne by the applicant.

Paris, February 27th, 1920.

(Signed) Gaston Deschamps.

LAW OF AUGUST 9TH, 1920.

CHAPTER I.

Stations for the Service of Aerial Navigation.

Art. 1.—The Service of Aerial Navigation instals and exploits all Radioelectric Stations which are necessary to assure the carrying out of the Service and the security of aviators.

Art. 2.—The technical particulars of these stations (location, power, nature of transmission, wavelength, call letters) are arranged between the Under-Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport.

Art. 3.—If interference is caused by Stations of the Service of Aerial Navigation, or if these are interfered with by foreign stations the Under-Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport will agree on the technical means to be employed to avoid such interference.

Art. 4.—Certain stations of the Service of Aerial Navigation may be open to private correspondence by arrangement between the Under-Secretary of State for Posts and Telegraphs and the Under-Secretary of State for Aviation and Aerial Transport. In this case the tax payable for each telegram will be established in accordance with the rules in force for radiotelegraphic correspondence with ships at sea.

CHAPTER II.

Land Stations Installed by Private Companies.

Art. 5.—Land Radioelectric Stations may be installed by Companies for Aerial Navigation, or by private persons with the object of communicating with aviators or to ensure their safety.

These stations and their personnel will be subject to the rules already issued, or to be issued in the future by the Administration of Posts and Telegraphs, for all private Radiotelegraph Stations.

Art. 6.—Requests for permission to instal stations and for licenses for personnel must be sent to the Service of Aerial Navigation. If the latter decides that they are justified by the necessities of aerial traffic, and that they will not compete with its own installations, such requests are forwarded to the Administration of Posts and Telegraphs together with their remarks. If the Administration grants such authorisation this will be made through the Service of Aerial Navigation, who, in turn, will advise the applicant.

Art. 7.—The Under-Secretary of State for Posts and Telegraphs delegates to the Under-Secretary of State for Aviation and Aerial Transport the control and working of stations defined in Article 5. It retains, however, its direct right of control in so far as complaints concerning the stations or the services committed by the latter are concerned. In this case a warning is given to the Under-Secretary of State for Aviation and Aerial Transport in order that a representative of this department may attend the enquiry and give his views. He makes a direct report to his department.

CHAPTER III.

Aircraft Stations.

Art. 8.—Aircraft Radioelectric Stations are of two categories those of the first category being utilised both for safety in navigation and for private communication; those of the second category being utilised solely for safety in navigation.

Art. 9.—The installation of all the stations defined in Article 8 and their control are under the same rules which regulate Wireless Stations of the Mercantile Marine.

Art. 10.—The personnel of stations of the first category are subject to the same rules as the Radiotelegraphic personnel of the Mercantile Marine.

Art. 11.—The personnel of stations of the second category must be in possession of a Special License granted by the Under-Secretary of State for Posts and Telegraphs.

Art. 12.—The Under-Secretary of State for Posts and Telegraphs delegates to the Under-Secretary of State for Aviation and Aerial Transport the right to authorise the installation of stations as defined in Article 8, also their control and working with the following exceptions :—

(*a*) Only apparatus of the type agreed upon by the Under-Secretary of State for Posts and Telegraphs may be authorised, and

(b) The Under-Secretary of State for Posts and Telegraphs exercises his direct right of control when he receives complaints concerning these stations, or of mistakes committed by them. In this case he warns the Under-Secretary of State for Aviation and Aerial Transport in order that a representative of the latter department may take part in the enquiry and give his views. He makes direct report to his department.

ART. 13.—In order to permit of the control during a flight of Radioelectric Installations, the authority in charge of all aircraft must freely allow representatives of the Administration of Posts and Telegraphs and of the Service of Aerial Navigation to make inspection on board from time to time.

ART. 14.—Requests for authority to instal stations on board aircraft must be sent to the Service of Aerial Navigation. It should be stated whether stations of the first or second category are required.

CHAPTER IV.

ART. 15.—The stations mentioned in Articles 5 and 8 are subject to "Subscription" tax for management expenses which the Controlling Company is obliged to pay over to the Treasury. This Subscription Tax is fixed at 200 francs annually per kilowatt and per station, any fraction of a kilowatt being counted as one kilowatt and the minimum amount payable per station being fixed at 200 francs. It is payable to the State on January 1st for a complete year, and is due from the day when the station is put in commission; for the first year the amount is calculated proportionately to the time yet to run before December 31st.

ART. 16.—Any company which benefits under the arrangements of this regulation for a given time will only be taxed for a portion of the aircraft affected. The Under-Secretary of State for Aviation and Aerial Transport will determine the number of the latter; failing the total of aircraft affected the number of them which should come within the scope of this regulation.

ART. 17.—Every time that an aircraft is replaced by another the license granted for the wireless station will be valid for the second machine and a fresh tax will not be payable.

ART. 18.—In all localities where no Radioelectric Station controlled by the Administration of Posts and Telegraphs exists for communication with aviators, the Service of Aerial Navigation and the Controllers of Stations named in Article 5 must receive and transmit gratuitously all Official Government Telegrams, on condition that they emanate from or are destined for aircraft.

ART. 19.—In case of interruption of their radio communication the Service of Aerial Navigation and the Controllers of the Station named in Article 5 are authorised to route their urgent service radio communications through the Administration of Posts and Telegraphs, which will give them priority in transmission.

Reciprocally the Service of Aerial Navigation and the Controllers of Stations named in Article 5 must, in the case of interruption of radio communications of the Administration of Posts and Telegraphs, transmit gratuitously through their stations during the hours at which they are open, official or private telegrams destined for aircraft which may be sent to them by the Telegraphic Offices of this Administration.

ART. 20.—Radio communications relative to the flight and safety of aircraft have priority over those set out in Articles 4, 18, and 19.

ART. 21.—The present law will be deposited with the Under-Secretary of State for Posts and Telegraphs (Central Service) and with the Under-Secretary of State for Aviation and Aerial Transport for notification to those whom it concerns.

DECREE OF AUGUST 26TH, 1920, FIXING THE TAX FOR RADIOGONIOMETRIC MESSAGES.

ART. 1.—Each Radiogoniometric Message sent by a Land Station at the request of a Mobile Station (Aircraft) will be liable to a fixed Coast Tax of 6 francs.

ART. 2.—Mobile Wireless Stations belonging to the Departments of the Navy and of War (warships and war aircraft) are exempted from the Radiogoniometric tax.

ART. 3.—In accordance with Article 6 of the Law of November 29th, 1850, the State accepts no responsibility in connection with Radiogoniometric Messages.

ART. 4.—The date of the announcement of the application of the tax mentioned in Article 1 will be fixed by a Law of the Under-Secretary of State for Posts and Telegraphs.

ART. 5.—The Minister of Public Works and the Minister of Finance are charged, in so far as they are respectively concerned, with the carrying out of the present Decree, which will be published in the *Journal Officiel* and inserted in the *Bulletin des Lois*.

DECREE OF MAY 15TH, 1921, MODIFYING ARTICLES 3 AND 4 OF THE DECREE OF FEBRUARY 24TH, 1917, RELATING TO RECEIVING STATIONS.

ART. 1.—The dispositions of Articles 3 and 4 of the Decree of February 24th, 1917, relative to the reception radioelectric signals are modified as llows:—

ART. 3.—Radioelectric receiving stations of all kinds are authorised under the conditions fixed by a special law for each category made by the Under Secretary of State of Posts and Telegraphs after notice due to the ministerial departments interested.

ART. 4.—The royalties payable to the concessories of the authorised stations are fixed by the Under Secretary of State of the Posts and Telegraphs by agreement with the Minister of Finance.

Stations for the reception of time and meteorological signals and experimental stations are subject to a payment fixed at 10 francs per station per year.

ART. 2.—The Ministeries of Public Works, of War, the Navy and Finance are charged etc.

LAW OF JUNE 18TH, 1921,

Fixing the conditions of the establishment and use of transmitting radioelectric stations, which, by the application of the Decree of February 24th, 1917, may be granted for experimental purposes after notice to the Minister of War and the Navy.

ART. 1.—Applications for licenses to be addressed to the Administrator of Posts and Telegraphs.

The applicants must state the precise situation of the station, together with its principal technical characteristics (system of transmission, power, wavelength, etc.), and furnish a diagram of connections of the apparatus as it will be used.

These particulars must be accompanied by full details of the purpose of erection and use, when the applicant proposes to use a power greater than 100 watts and a wavelength of more than 200 metres.

All important modifications of principle which may be made later in the constitution of a licensed station must be notified to the Administrator of Post and Telegraphs who will examine it and make such alterations to the original license as will render it applicable to such modification.

Art. 2.—If there is no objection to the establishment of the projected station the applicant is invited to give under stamp in duplicate an engagement to place himself under the conditions set out by the present law.

Art. 3.—When he is notified that he has been accorded the license, the licensee can proceed to erect his station at his own trouble and expense. The cost of maintenance falling also to him.

Art. 4.—Licenses given do not constitute a privilege or prevent further licenses of the same nature being given later to any applicant whatever. They are not transferable.

The licenses are essentially revocable.

The Administrator of Posts and Telegraphs can at any time and for any reason suspend or revoke licenses given without payment of any indemnity and without giving any reason for this decision to the licensee.

At the first request by the Administrator of Posts and Telegraphs the licensee must immediately put his station out of action. A maximum delay of one month can be given for the definite suppression of the station.

In the case where the licensee does not obey the request of the Administrator of Posts and Telegraphs they can proceed at the cost of the licensee to put out of action and suppress the said station.

The licensee can at any time by his own wish terminate his license. In this case also are applicable the preceding dispositions concerning the putting out of action and dismantling of the station.

The licenses for experimental transmitting stations being given at the holder's risk, the State has no responsibility for difficulties which may arise betweenthe licensee and societies or companies to whom licensees have also been given or in general for any cause or reason whatever.

Art. 5.—The station licensed can only be used for scientific researches or the testing of apparatus, they may not serve in any case to transmit correspondence having a character personal or actual even in the particular or personal interest of the licensee.

Art. 6.—The use by a licensee of a transmitting station with a receiving station attached entails for the licensee the obligation to submit himself to the dispositions and regulations relative to the establishment and use of radio-electric receiving stations and to apply to the Administrator of Posts and Telegraphs for the corresponding license.

Art. 7.—The Administrator of Posts and Telegraphs reserves to itself the right to exercise a control permanent or temporary on licensed stations in any manner which appear to them to be the most convenient.

Moreover, the licensee when he is notified that he has been accorded a license must make the payment given in Article 4 of the Finance Law of July 31st, 1920.

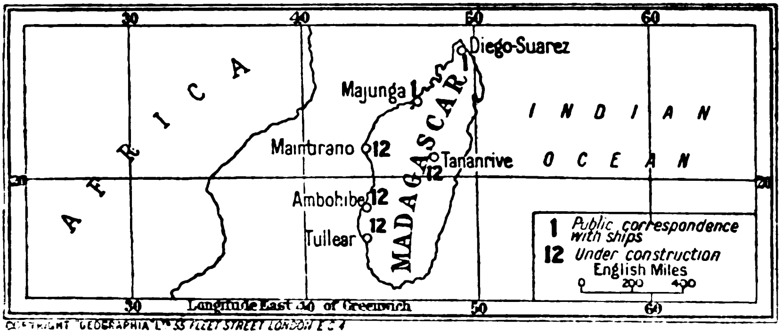
Art. 8.—Licenses granted are subject to all laws, regulations, and legislation which may intervene.

Colonies of France

THE first trials of Wireless Telegraphy in French Colonial Possessions date from the closing years of the last century. From 1901 to 1907 the local services of the principal Colonies followed experiments in the new method of communication. The apparatus, of a type to-day obsolete, included direct excitation with induction coil and the registration of signals by means of the coherer.

These pieces of apparatus proved very satisfactory, despite the difficulties of establishing communication by wireless in tropical zones, caused through the intensity of electrical atmospheric disturbances in those regions. Trial stations were erected in 1902 and 1903 by Captain (now General) Ferrié, at Martinique and Guadeloupe, to replace the cable joining these two islands, which was broken by the eruption of Mont Pelé. Thus was the first commercial wireless service established in the French Colonies. Experiments made after 1907 demonstrated the necessity of replacing the old apparatus by the "Musical Spark."

From 1907 to 1912 the Governor administering West Africa developed the first coast system, embodying the stations of Dakar, Rufisque and Port-Etienne. Later this was completed by the construction of stations at Konakry (in Guinea) and Tabou (on the Ivory Coast). A station was also erected by the French Government at Monrovia, in the Republic of Liberia. At the same time it was decided to organise a large central station at Timbuctoo, whose effective range should include the Mediterranean Coast. At Madagascar there were first constructed stations at Mayotte (Comoro Island) and Majunga, and later on at Diégo-Suarez, whilst in Indo-China were erected the stations at Cap-Saint-Jacques, at Kien-An, at Quang-Tcheou-Wan and at Hanoi. Such was the Colonial system about the end of 1912. The



period of the world-war then intervened, effectually sealing all sources of information regarding wireless.

After this period certain modifications were made when the new stations were put into service. At the present time the system consists of the following stations :—

INDO-CHINA. Tonkin : Hanoi, Kien-An, Moncay, Caobang, Hagiang and Lai-Chau. There are also two direction-finding stations at Kien-An and Cac Ba (Along Bay). The territory of Quang Tcheon Wan : Quang Tcheon-Wan. Laos : Vientiane and Luang Prabang. Annam : Tourane. Cochin China : Saïgon, Mytho, Paulo-Condore and Phu-quoc. (See map page 467.)

FRENCH WEST AFRICA. Sénégal : Dakar, Rufisque. Mauritania : Port Etienne, Atar, Chingnetti. Guinea : Conakry. Liberia : Mourovia. Ivory Coast : Tabou. Higher Sénégal : Niger, Kabara, Zinder, Tahoua, Kindal, Agades, Bilma and N'Guigmi.

FRENCH EQUATORIAL AFRICA. Cameroons : Duala. Gabon : Laonga. Tchad : Fort Lamy, Mao, Faa, Abécher, Ati, Faya, Fada. Also Liranza, Brazzaville and Bangui, in course of construction.

MADAGASCAR. Diégo : Suarez and Tamatave. Dzaoudzi (Mayotte Island), Mutsamudu (Anjouan Island). Under construction : Tamatane and Tuléar. Projected : Réunion.

FRENCH SOMALILAND. Djibouti. Under construction : Obock.

NEW CALEDONIA AND NEW HEBRIDES. Nouméa and Port Vila.

FRENCH OCEANIA. Papeete.

ANTILLES (FRENCH WEST INDIES). Martinique : Fort-de-France. Guadeloupe : Destrellan.

FRENCH GUIANA. Cayenne. Under construction : Regina.

SAINT PIERRE AND MIQUELON. Saint Pierre. Miquelon.

In 1917 the Government decided to commence the erection of a big Inter-Colonial system of wireless stations, viz., those at Saida (South Algeria), Bamako (French West Africa), Brazzaville (French Equatorial Africa), Tananarive (Madagascar), and Saigon (Indo-China). It is expected that these will be completed in 1923.

The project was abandoned with regard to the station at Saïda, but the remainder are in course of construction.

The completion of the French inter-colonial radiotelegraph system will require the construction of the following other stations of the same type :—

Nouméa and Papeete to serve as relays for the French Pacific possessions,

which are at present almost isolated, and in all cases a long distance from cable stations.

Djibouti.

Martinique.

French West Africa.

One station of the system, that at Martinique, will maintain communication with Tahiti (9,000 kilometres), West Africa (4,500 kilometres), France (7,000 kilometres), and will act as relay station between America and the Panama Canal.

Such constitutes, on broad lines, an outline of the development of the French Colonial wireless telegraph system.

The local systems of these Colonies are organised and regulated by their Governor-Generals and the other Administrators affected. Co-ordination in working is secured through the intermediary of the French Colonial Office (Economical Services Department), to which is attached a Special Committee, entitled the Colonial Committee of Radiotelegraphy, whose business it is to advise on all matters of general concern.

FRIENDLY ISLANDS

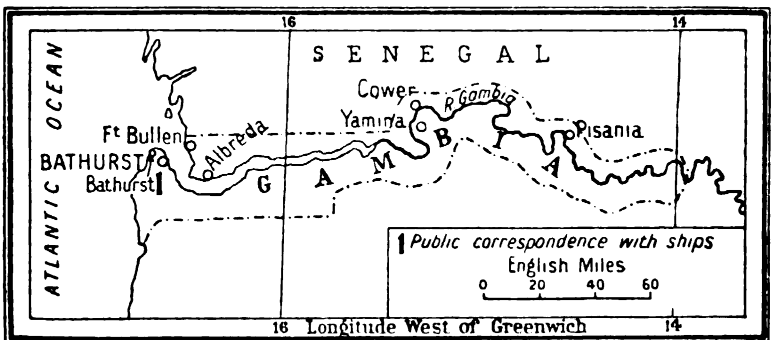
(See Pacific Islands—Tonga Islands.)

GAMBIA

THE Colony of the Gambia was created in 1843, after a long history of trading competition in this locality with the Portuguese and French, dating from the time of Queen Elizabeth. Its separate constitution was inauguarated in 1888. The total area of the various islands and mainland adjacent thereto which go to make up the Colony is estimated at 4,000 square miles. The chief town is Bathurst, situated on the island of St. Mary, at the mouth of the River Gambia, in 13° 24′ N. latitude. Ruled as a Crown Colony, the administration is vested in a Governor assisted by two councils, one executive and one legislative, consisting of nominated and elected members.

ORGANISATION.

Wireless telegraph and telephone stations are established at Bathurst and Georgetown, MacCarthy Island. These two stations are equipped with Marconi Y.C. 3 installations and were erected early in 1921. They are entirely under the control of the Government and are open for public inland



traffic from October to June. They do not at present communicate with ships, but arrangements to enable them to do so are under consideration.

There are no privately owned wireless stations in the Colony, nor are there any wireless clubs or societies.

ADMINISTRATION.

The rules governing the working of wireless telegraphy in this Colony were originally instituted under the Ordinance (Maintenance of Control) of 12th February, 1903. This has now been repealed and the ruling Ordinance is that of the 22nd of September, 1913, entitled "An Ordinance to provide for the Regulations of Telegraphs." The text will be found below.

A—Ordinance, September 22nd, 1913.
B—Schedule.
C—Rules under 1913 Ordinance.

A I. This Ordinance may be cited as "The Telegraphs Ordinance, 1913."

II. The words "telegraphy" and "telegraph" mean any system used for conveying transmitting or distributing electricity or any like agent for the purpose of communication from one point to another.

The expression "wireless telegraphy," means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

III. The Governor may, whenever he shall deem it expedient to do so, license the establishment of any telegraph station, or the installation or working of any apparatus for wireless telegraphy, in any place in the Colony or Protectorate or on board any British ship registered in the Colony.

IV. (1) No person shall establish any telegraph station, or instal or work any apparatus for wireless telegraphy, in any place in the Colony or Protectorate or on board any British ship registered in the Colony except under, and in accordance with, a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period, as the Governor in Council may determine and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

V. (1) If any person establishes a telegraph station without a license in that behalf or instals or works any apparatus for wireless telegraphy without a license in that behalf he shall be liable to a fine not exceeding one hundred pounds or to imprisonment with or without hard labour for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for telegraphy installed or worked without a license; but no proceedings shall be taken against any person under this section except with the sanction of the Legal Adviser to the Governor.

(2) If the Chief Magistrate, the Police Magistrate, or a Justice of the Peace is satisfied by information on oath that there is reasonable ground for believing that a telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf, he may grant a search warrant to any Police Officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used, or intended to be used, for telegraphy therein.

VI. (1) The Governor in Council may amend, vary or revoke any of the regulations contained in the Schedule to this Ordinance, and may make regulations for all or any of the following matters:—

(i) prescribing the form and manner in which applications for licenses under this Ordinance are to be made;

(ii) prescribing the fees payable on the grant of any license;

(iii) prohibiting or regulating the use of telegraphy in such telegraph stations, or of wireless telegraphy on board such ships while in such waters, by such further rules as the Governor-in-Council may see fit to make from time to time, and either in all cases or in such cases as may be deemed desirable, if at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over telegraph stations or over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Colony.

(2) Provided that no regulations made in respect of the provisions in this section contained shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

VII. When an applicant for a license proves to the satisfaction of the Governor that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted subject to such special terms, conditions and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

VIII. (1) Every omission or neglect to comply with, and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulation made thereunder, or in breach of the conditions and restrictions subject to, or upon, which any license has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding fifty pounds or to imprisonment with or without hard labour for a term not exceeding six months.

(2) All convictions, forfeitures and fines under this Ordinance or any regulations made thereunder may be had and recovered before a Court of Petty Sessions.

IX. Nothing in this Ordinance contained shall invalidate or impair any agreement now in force entered into between the Governor of this Colony, or the Imperial Government on behalf of the Government of this Colony, and any telegraph company, relative to the laying down or landing of any telegraphic cable, the removal, renewal, maintenance and use thereof, or to the payment of any subsidy to such company by the Government of this Colony or any other the like matter.

X. Nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

XI. The Telegraphic Establishments (Maintenance of Control) Ordinance 1903 is hereby repealed. * * *

To this Ordinance is attached a Schedule which runs:—

THE SCHEDULE.

B 1. All apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the territorial waters of the Colony shall be worked in such a way as not to interfere with (*a*) naval signalling, or (*b*) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, or in the Protectorate, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, shall be worked or used whilst such ship is in any of the harbours of the Colony or Protectorate except with the special or general permission of the Governor.

3. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

* * *

It will be noted that under Section VI of this Ordinance the Governor-in-Council has power to make regulations. Of those which His Excellency has accordingly promulgated under date of the 28th January, 1914, the text runs as follows:—

RULES MADE BY THE GOVERNOR-IN-COUNCIL UNDER SECTION VI OF THE TELEGRAPHS ORDINANCE, 1913.

C 1. These rules may be cited for all purposes as "The Telegraph Rules, 1914."

2. The expression "the Company" shall mean any company, corporation or person for the time being engaged in the Colony or Protectorate of the Gambia in transmitting or receiving telegrams.

3. If and whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that the Government of the Colony and Protectorate of the Gambia shall have control over the transmission of telegrams by the Company, it shall be lawful for the Governor by warrant under his hand to direct and authorise such persons as he may think fit to assume the control of the transmission of telegrams by the Company either wholly or partly and in such manner as he may direct, and such persons may enter upon the Company's premises accordingly or the Governor may direct the Company to submit to him or any person authorised by him all telegrams tendered for transmission or received by the Company or any class or classes of such telegrams, and to stop or delay the transmission of any telegrams or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of telegrams as the Governor may prescribe, and the Company shall obey and conform to all such directions.

Provided always that if default shall be made by the Company in the observance or performance of any provision hereinbefore contained it shall be lawful for the Governor by warrant under his hand to direct and cause so much of the Company's works as are in the Colony or Protectorate of the Gambia or any part of such works to be taken possession of for such services as to the Governor may seem fit, and in that event any person authorised by the Governor may enter upon the offices and works of the Company or any of them and take possession thereof and use the same as aforesaid. Nothing herein contained shall be deemed in any way to prejudice or abridge the power of the Government of the Colony and Protectorate of the Gambia to take possession under or by virtue of any agreement for the time being in force.

4. In any such case as aforesaid if the Company show that during the exercise of any of the powers aforesaid their receipts from the telegraphs with respect to which the said powers have been exercised have been less than their receipts from the same source during a corresponding period on the average of the last three years preceding the Government of the Colony and Protectorate of the Gambia shall pay to the Company as compensation for any loss of profit sustained by the Company by reason of the exercise by the Governor of any of the powers hereby reserved such sum as may be settled between the Governor and the Company by agreement or as in case of difference may be determined by arbitration. Provided always that no such compensation as aforesaid shall be paid if and so far as the powers hereby reserved to the Governor are exercised for the purpose of preventing direct communication with any of His Majesty's enemies, and save with the consent of the Governor no such compensation shall be paid if and so far as the powers aforesaid are exercised for the purposes of preventing indirect suspected communication with any of His Majesty's enemies or of protecting the interests of His Majesty under the apprehension of impending war.

5. In estimating such compensation as in the preceding section provided the Arbitrator shall take into account all the circumstances of the case, including not only any such loss as aforesaid but also any additional profit accruing to the Company from the emergency which gave rise to the exercise of the powers aforesaid, and as regards the telegraphs with respect to which the said powers have been exercised the receipts of the Company on the average of the last preceding three years during a period corresponding to that of the exercise of the said powers shall be deemed to be the receipts which the Company would have taken during the period of the exercise of the said powers had the powers not been exercised.

GEORGIA

THIS small Republic has only recently gained its independence, and lies in the mountainous region of the Caucasus. Its chief town is Tiflis, whilst it possesses in Batum its outlet to the world through the Black Sea.

CONTROL.

Wireless Telegraphy constitutes a State monopoly, and is under the control of the War Office.

ORGANISATION.

The first wireless station on Georgian territory was erected during the war in 1914 for the use of the Caucasian Army which was fighting on the Turkish front. The following stations are those now existing: Tiflis, Batum and Poti.

Great improvement was made in the wireless services in 1918, when Germany recognised the independence of Georgia and a small Expeditionary German Corps was sent to the Republic. The Germans maintained a wireless service between Tiflis and Berlin by means of several ships on the Black Sea through Batum and Constanza (Roumania).

At the present time there is a very powerful station at Tiflis which was improved by the Italians. The Director of this station is Prince A. Andronikashvili and there are six other officials.

During the last months of 1920 the Georgian Government concluded an agreement with some French companies to erect four wireless stations in various parts of Georgia; these new stations will connect Georgia with large European centres, such as Paris, London, Rome, Moscow, etc. The central wireless station will be erected in Tiflis.

No other classes of wireless stations exist, but Government stations are used for commercial purposes and also for communicating with aircraft.

The employees of the wireless station have to pass a special examination, and a certificate is issued to them to that effect. No amateurs are admitted to it.

The Tiflis Wireless Station receives and despatches messages to and from Moscow, Basra and Constantinople, thereby acting as a relay station between these points. There is also one British Light Cruiser, one Italian Destroyer, and one American Destroyer at Batum, which have wireless installation and work in conjunction with the Georgian Central Station in Tiflis.

ADMINISTRATION.

No special laws exist yet, although they are now receiving consideration.

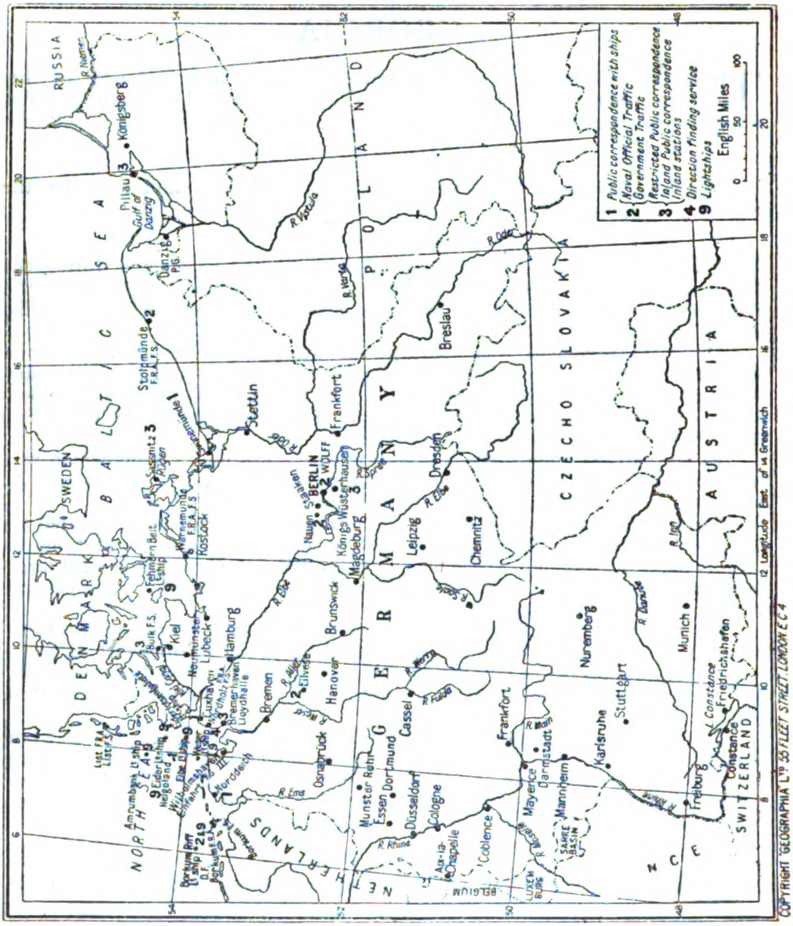
GERMANY

THE German " Empire " dates only from April 16th, 1871, when the kingdoms of Prussia, Bavaria, Saxony and Wurtemberg, together with six Grand Duchies, five Duchies, seven Principalities, and the " Free Towns " of Lubeck, Bremen, and Hamburg, elected the King of Prussia as *Deutscher Kaiser*.

It is situated in the heart of Europe extending between 5° 50′ 0″ and 22° 55′ 0″ longitude east of Greenwich, and 47° 80′ 0″ and 55° 18′ 0″ latitude north.

CONTROL.

Wireless telegraphy in Germany falls under the control of the Telegraphs Administration and is managed and administered as a unit of the Imperial Communications Department. The supreme authority for all wireless telegraphy in the German Empire is the Imperial Post Office Department under the Secretary of State. Wireless forms a special department (V), which



settles fundamental questions of equipment, administration, communication and management. The technical matters in wireless telegraphy and the construction and working of wireless telegraphy installations, belong to the business side of the Wireless Department (IV) of the Imperial Telegraphs Technical Department, which is directly under the Imperial Post Office.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
Mr. Giesberts	Minister of Posts	Berlin.
Dr. Engineer h.c. Hans Bredow ..	Controller of Wireless Telegraphy	Berlin.

ORGANISATION.

Wireless telegraphy, after having demonstrated its serviceability as the result of trials, was brought into the service of general public communication as early as the year 1900, by the utilisation of the coast wireless station on the

Island of Borkum. Since then the practical use of wireless telegraphy, which has kept pace with technical development, has been advanced to such a degree that on the outbreak of the world war there were in Germany and in countries under German protection 26 coast stations and over 600 ship stations, in addition to numerous testing stations. There further existed the high-power wireless stations of Nauen and Eilvese for traffic with America and with the high-power stations of Kamina (Togoland) and Windhuk (South-West Africa), as well as the wireless stations at Tsingtau, Yap, Nauru, Rabaul, and Apia.

The wireless traffic of Germany is organised as follows :—

1. World Traffic.

Wireless traffic with overseas countries is carried on by the long range stations of Nauen and Eilvese, which stations make possible general public communication with the United States of America (corresponding stations Marion and Annapolis) and beyond (Central and South America and Asia), whilst the forwarding of press telegrams to these countries falls on the long range station of Eilvese alone. The chief wireless station of Königs Wusterhausen (near Berlin) is used generally for traffic with European countries and makes possible traffic with :—

Great Britain	(corresponding station, London).
Italy	(corresponding station, Rome).
Hungary	(corresponding station, Buda Pesth).
Bulgaria	(corresponding station, Sofia).
Jugo-Slavia	(corresponding station, Sarajevo).
Norway	(corresponding station, Christiania).
Sweden	(corresponding station, Karlsborg).

Traffic with Spain (corresponding station, Carabanchel and Aranjuez), with Russia (corresponding station, Moscow), and with Rumania (corresponding station, Bucharest), is ensured by Nauen.

Traffic with the Netherlands (corresponding station, Rotterdam) is conducted through the wireless station at Hamburg.

The two large stations are worked by private companies under the supervision of the Government, Nauen by the Aktiengesellschaft " Drahtloser Uebersee-Verkehr " (Wireless Overseas Traffic, Ltd.), and Eilvese by the Eilvese G.m.b.H. (Eilvese, Ltd.). Königs Wusterhausen is the property of the Imperial Telegraphs Administration, and is worked by it. It is worked in accordance with the rules laid down by the International Telegraphs Agreement and the present executive arrangement, but telegraphed postal orders are not conveyed by wireless. For communication with European countries the rates for transmission by wireless and by ordinary telegraphy are the same. The German Telegraphs Administration therefore reserves itself full choice, as a rule, of the method to be adopted (wireless or wired telegraphy) for clearing traffic with these countries. If, however, the sender of the telegram is afraid of unauthorised persons listening, which, owing to the peculiarities of wireless telegraphy, is not entirely impossible, and therefore expressly desires the message to be forwarded on the wires, he must write in the space provided on the telegraph form for the route the word " fil," in accordance with the resolutions of the European Communications Conference held at Paris in July, 1920.

For overseas traffic the rates for wireless are lower than those for cabled telegraphy ; the route to be followed must therefore be shown by the sender.

The high-power wireless station of Nauen possesses, in addition to a musical note transmitter, high frequency machines of the system of Count Arco ; Eilvese is fitted with high frequency machines of the Goldschmidt system ; Königs Wusterhausen has undamped apparatus including a 32 kw. Lorenz transmitter (Poulsen arc) and a 10 kw. valve transmitter.

Since the traffic performed by the four wireless stations is not yet internationally regulated, they have not yet been shown in the official list of radiotelegraph stations, etc.

2. Ship Traffic.

For the purposes of traffic with ships at sea, 20 coastal stations are at present in operation. They are as follows:—

(*a*) Open for public service: Cuxhaven, Heligoland, Norddeich and Swinemünde.

(*b*) For restricted public service: Borkum F.S. (Funkenstelle-wireless station), Bülk F.S., List F.S., Nordholz F.S., Pillau F.S., Sassnitz, Wilhelmshaven III, Einfahrt F.S., and the light ships *Amrunbank, Borkum Riff, Eider, Eiderlotsengaliote, Elbe Eins, Fehmarnbelt* and *Weser*.

(*c*) For Naval service traffic only: Stolpmünde F.S. and Warnemünde F.S.

Of German ships 357 vessels are at present fitted with wireless stations, namely, 225 merchant ships and 132 naval vessels.

The working of the coastal and ship stations, as well as that of ship stations between themselves, is performed in accordance with the provisions of the International Radiotelegraph Convention (London, 5th July, 1912), and the Service Regulations annexed thereto, as well as the "Anweisung für den Funkentelegraphendienst vom 15th June, 1913" (instructions regarding the Radiotelegraph Service of the 15th June, 1913), which was issued for Germany in accordance with the provisions of the International Convention.

Ship radiotelegraph stations may only be installed and worked on German ships with the approval of the State.

3. Imperial Wireless Service.

The Imperial Wireless system in course of construction is to be used for inland wireless traffic. It is destined to supplement and relieve the interior telegraph system, and consists at present of the head wireless station at Berlin and the leading district wireless stations of Dortmund, Frankfurt Main, Hamburg, Königsberg (Prussia), Leipzig, München (Munich) and Stuttgart, and the wireless stations of Breslau, Darmstadt, Düsseldorf, Elbing, Friedrichshafen, Hannover, Konstanz and Stettin. A further wireless station is in course of construction at Bremen. The leading wireless station of Hamburg also handles traffic with Rotterdam.

The Imperial Territory is divided into wireless districts (zones) whose traffic central points are formed by the "Leitfunkstellen" (chief district wireless stations). These are generally fitted with two transmitting and receiving sets of such strength that a direct exchange of wireless news with the chief wireless station of Berlin is possible. The wireless stations work only with the "Leitfunkstelle" (district station) of their zone. The traffic of the "Leitfunkstellen" and wireless stations between each other is effected in accordance with fixed traffic programmes. For the purposes of transmission only valve transmitters are used and owing to their great sharpness of tuning, a fairly close disposition of the transmission wavelengths is possible. For the Imperial wireless network the wavelengths used are between 1,000 and 3,000 meters with the exception of some of the lesser ones which are reserved for international sea traffic, and naval and air purposes.

The exchange of wireless telegrams is in recent times effected more and more by duplex working and with high speed telegraph apparatus.

The publication of the chief district wireless stations (Leitfunkstellen) and ordinary wireless stations (Funkstellen) in the "Nomenclature Officielle des stations radiotélégraphiques," etc., has not been effected up to the present for the same reasons as stated with regard to the wireless stations previously mentioned.

4. Circular (*i.e.*, Broadcasted) Wireless News.

In addition to the Imperial wireless network, there now exists a system of 75 official wireless receiving stations, by means of which news agencies, trade and navigation circles, meteorological offices, etc., are enabled to receive by the quickest means identically worded news reports, especially

those of an economic character (trade reports, Stock Exchange quotations, etc.) sent out from one central point (Königs Wusterhausen), and destined for numerous receiving stations at the same time. In addition to this official wireless telegraph circular service, it is intended to institute a wireless telephone circular service so that wireless telephonic receiving installations may be erected with private subscribers for the direct reception of this news. The further development of this service will tend, amongst other things, to the installation, in larger towns and their immediate vicinity, of local circular (*i.e.*, broadcasting) wireless apparatus.

5. SPECIAL TRAFFIC.

(*a*) *Radio Direction Finding Service.*

For the radio direction finding service there are, on the German coasts, the radio direction finding stations of Borkum F.R.A., Nordholz F.R.A., List F.R.A., Stolpmünde F.R.A., and Warnemünde F.R.A., which are supported by the directional indications of the wireless stations of Borkum F.S., Nordholz F.S., List F.S., Stolpmünde F.S., Warnemünde F.S. and Wilhelmshaven III, Einfahrt F.S. The directional indications are given free of charge. Further installations of this kind will, it is anticipated, be erected at Cuxhaven and Norddeich. The radio directional stations of Stolpmünde F.R.A. and Warnemünde F.R.A., are used for naval service traffic only. Further particulars as to the geographical position, etc., are to be found in the Nomenclature Officielle des stations radio-télégraphiques, etc.

(*b*) *Time Signal Service.*

The Nauen high-power station broadcasts daily at 1 a.m. and 1 p.m. (central European time) on a wave of 3,900 m. (musical note), time signals in accordance with the Onogo arrangement as agreed upon at the Paris Time Signal Conference.

(*c*) *Radio Meteorological Service.*

The task of the meteorological news service is to collect observations relative to home and foreign countries, to compare them, and to arrange for their re-transmission to all places requiring them for their weather predictions. The telegraphic transmission of the individual reports of the meteorological stations situated in the Imperial territory, to the collecting station "Deutsche Seewarte" (Marine Observatory), Hamburg, is usually effected over the State telegraph wires. In order to avoid delay to the weather reports transmitted by wireless from the observatories to the German Marine Observatory, and in order to make radio telegraphy still more useful for the meteorological news service, it has been arranged, experimentally, to forward by wireless to Hamburg the weather reports of such observatories as have good wire communications with one of the postal wireless stations in the neighbourhood. For the wireless transmission of the observations of the meteorological stations to the meteorological news centre of the German weather service, the wireless stations at present used, having regard to the present state of the Imperial wireless network, are Frankfurt/Main, Swinemünde, Hanover, Breslau, Munich, Königsberg (Prussia), and Berlin. The meteorological stations give their observations direct by telephone to the wireless stations.

The radio weather service is divided into inland, foreign and ship weather service.

ADMINISTRATION.

For some time past authorisations have also been given for the erection and working of private wireless installations in which are distinguished "Experimental installations for sending and receiving," "Experimental installations for receiving," "Installations for the reception of the Nauen time signal" and "Wireless Working installations (Sending and Receiving installations) for overland power stations, water works, etc." The conditions in which they are approved will be determined more precisely in accordance with the special circumstances of each case.

The conditions upon which such approval is dependent for the instal-

lation and working of a ship's wireless station are shown below. They correspond with a portion of " Anweisung für den Funkentelegraphendienst."

With regard to the division of ship stations (Article XIII of the Service Regulations annexed to the International Radiotelegraph Convention) into categories, the following provisions apply in Germany :—

(1) To the 1st Category (stations with continuous service) : belong the wireless stations—
 (*a*) On all passenger steamers in the Transatlantic service to America.
 (*b*) On all passenger steamers with a gross carrying capacity of not less than 6,000 tons and a speed of not less than 14 knots.
 (*c*) On all passenger steamers (with the exception of those included under (*a*) and (*b*), having on board 1,000 or more persons (without crew and deck passengers).

(2) In the second category (stations with restricted working hours) will be comprised : the ship stations on all other passenger vessels not included from 1*a* to *c*.

(3) In the third category (stations without fixed working hours) will be included : the ship stations on all cargo stations.

The carrying out of the wireless service on ships is regulated in the following manner :—

(1) Ships having a wireless station of the 1st Category must have on board at least two first class telegraphists.

(2) Ships having a wireless station of the 2nd Category must have one telegraphist of the 1st Class and at least a second man who is competent to maintain listening service for the first ten minutes of each hour outside the regular hours of service.

(3) Ships having a wireless station of the 3rd Category must have one telegraphist of the 2nd Class.

New regulations having as their object the regulating of the equipment of ships with wireless apparatus and their manipulation by wireless telegraphists in accordance with the International efforts for the protection of human life at sea, are in course of preparation.

The use of telegraph installations on foreign vessels for navigation at sea and for inland navigation, within German territorial waters, is regulated on the basis of paragraph 3*b* of the Telegraph Law of the 6.4.92/7.3.08, by the provisions set forth below.

The present Wireless Laws and Regulations appear in accordance with the following list :—

A—Telegraph Law of the German Empire, March 7th, 1908.
B—Regulations (Foreign Ships).
C—Conditions of Concession (Ship Stations).
D—License for Aeroplane Wireless Installations.
E—License for Experimental Wireless Installations.
F—License for Wireless Receiving Installation for the reception of NAUEN time signals.
G—License for Wireless Receiving and Transmitting Installations for overland power station waterworks, etc.

A *Sole Article.*—The Act of April 6th, 1892, relating to telegraphs in the German Empire is modified as follows :—

1. Article 3 is completed by the following paragraph (2) :—

Installations of electric telegraphs for transmission of messages without the aid of metallic wires of junction shall not be established and worked, except with the authorisation of the State.

2. The following provisions are inserted after Article 3 :—

(3*a*) Telegraphic installations which are not exclusively designed for the internal service of a ship cannot be established and worked on German vessels unless authorised by the State.

(3*b*) The Imperial Chancellor shall decree the regulations concerning the working of telegraph stations on board foreign vessels in German territorial waters.

3. Article 7 is completed by the following paragraph (2) :—

The provision of Paragraph 1, Phrase 1, does not apply till July 1st, 1913, to installa-

tions of the nature defined in Article 3, Paragraph 2.

B The following regulations are decreed for the working of telegraphic installations on board foreign ships in German territorial waters, and are founded on Article 3 (*b*) of the "Telegraph Law of the German Empire," of April 6th 1892, and March 7th, 1908, and under the reservation of Article 15 of this law:—

1. Ships of war are authorised, in a general manner—

(*a*) To exchange messages, signals, by means of optic and acoustic signals, submarine acoustic signalling excepted.

(*b*) To use wireless telegraphy, on condition that they do not disturb the radiotelegraphic service of the public coast stations, or the service of the coast or ship stations of the Imperial Navy.

In exchanging messages with German or foreign radiotelegraphic stations, foreign vessels must conform to the regulations of the "Decree for the Regulation of the Radiotelegraphic Service" and to the Decrees which may ultimately be promulgated.

2. Foreign vessels other than ships of war are authorised—till otherwise decreed—

(*a*) To exchange messages by means of optic and acoustic signals, submarine acoustic signalling excepted, and under the reservation that within the illumination zone of the navigable waters of the German coasts and islands the lights of the signal protectors or lanterns must not exceed that prescribed for fixed lights.

(*b*) To use wireless telegraphy in conformity with the provisions of the "Decree Regulating the Radiotelegraphic Service" and the decrees which may ultimately be promulgated; nevertheless, in the ports, roadsteads, and estuaries, and in the navigable waterways of the interior, wireless telegraphy can only be used on an authorisation being granted in writing by the Ministry of Posts and Telegraphs of the German Empire.

3. In the public interest the Articles 1 and 2 may be temporarily restricted or suspended.

4. Whosoever works telegraphic installations in a way not authorised by the preceding provisions is liable to fines determined in Article 9 of the "Law of Telegraphs," and in virtue of Article 40 of the Penal Code of the German Empire all the apparatus designed for the transmission of wireless messages can be confiscated. Moreover, installations which have been worked without a license can be, in conformity with Article 11 of the "Telegraph Law," removed or rendered unserviceable.

C The following are some of the principal conditions on which the concession for the installation and working of a radiotelegraph station on board ship is granted —

1. The concession for the installation and working of the ship station may be withdrawn at any time.

2. The station must fulfil the following requirements:—

(*a*) The construction of the station must be in accordance with modern developments of science and technology.

(*b*) The ship station must be equipped in such a way as to be able to use the two wavelengths of 600 and 300 metres.

(*c*) The waves must be as pure and little damped as possible. The use of sending arrangements with which the production of the emitted waves takes place by direct sparking discharges of the antenna is not permitted, except in cases of distress. However, it may be allowed for certain special stations—*e.g.*, for such on small ships—the primary energy of which does not exceed 50 watts.

(*d*) The power transmitted by the radiotelegraphic apparatus, measured at the terminals of the generator, must not under normal conditions exceed one kilowatt.

(*e*) With the reservation of the special provisions concerning the application of the 1,800 m. wave, a power of more than one kilowatt may be used if the ship must maintain communication over a distance exceeding 200 nautical miles from the nearest coast station, or if, in consequence of exceptional circumstances, communication cannot be maintained except by means of an increase of power.

(*f*) The apparatus must be suitable for transmitting and receiving at a speed of at least 20 words per minute, five letters being counted as one word. Installations working with more than 50 watts must be equipped so as to be able to cover several distances within the normal range of transmission, the shortest of which shall be about 15 nautical miles.

(*g*) The receiving apparatus must be capable of reception up to 600 miles with the greatest possible protection against disturbances.

3. Ships belonging to the first two categories stated under Article 8, in addition to the ordinary apparatus, must be equipped with emergency gear having an independent source of power and capable of working for at least six hours, with a minimum range of 80 nautical miles in the case of ships in the first category, and of 50 nautical miles of those of the second category. The emergency gear is not necessary in the case of ships whose ordinary plant fulfils the conditions for emergency sets.

The emergency gear, as well as the ship stations themselves, must be placed as high as possible above the deck—viz., according to the structure of the ship and the available space, either equal to the height of the bridge or of the large boat deck, so that in case of accident they shall be able to remain longest above the water. When using batteries for the emergency plants accumulators may be arranged in the station room itself, whilst acid accumulators, on account of the vapours which they develop, must be placed outside the station room, but in its immediate vicinity and so that they are protected against outside influences.

4. The contractor must submit to the Imperial Telegraph Administration a descripton of the ship station, together with a plan of the circuits. Subsequent alterations of the technical equipment affecting transmission or reception must not be made without the consent of the Imperial Telegraph Administration.

5. In order to examine the prescribed arrangement of the ship's station, and the carrying out of the service, the officers of the Imperial Telegraph Administration are permitted at any time to enter the rooms where the apparatus is installed, and to inspect the working equipments.

6. The radiotelegraph service on the ship must be operated only by German subjects.

7. The service of the ship station must be carried out by an operator holding a certificate issued by the Imperial Telegraph Administration, or in an emergency, and for one journey only, by another Government which is a party to the International Radiotelegraphic Convention.

There are two classes of certificates.

The first-class certificate for the capability of the operator, with regard to:—

(*a*) The adjustment of the apparatus and knowledge of the methods of working.

(*b*) Transmitting of telegrams and receiving by sound at a speed of at least 20 words per minute.

(*c*) Knowledge of the regulations applying to the exchange of radiotelegraphic communication.

The second-class certificate may be issued to an operator who attains in transmitting and receiving a speed of 12 to 19 words per minute, but who fulfils the other conditions mentioned above. Operators holding a second-class certificate may be admitted:—

(*a*) On ships which use radiotelegraphy for their own service only and for the exchange of messages of the crew, in particular on fishing vessels.

(*b*) On all ships as junior operators, provided that such ships have on board at least one operator holding the first-class certificate. Nevertheless on ships placed in the first category mentioned in Article 8 the service must be carried on by at least two operators holding the first-class certificate.

Transmission may be made only by an operator holding either the first or second-class certificate, except in cases of emergency.

8. Ship stations are placed in three categories:

(1) Stations always open.

(2) Stations having limited working hours.

(3) Stations having no fixed working hours.

During navigation the following must remain permanently on the watch:—

(1) The stations of the first category.

(2) Those of the second category during the hours that they are open for service; out of these hours these stations must remain on the watch for the first ten minutes of each hour.

The stations of the third category are not bound to perform any regular "listening" service.

9. The ship station operator is under the supreme authority of the captain or of the captain's representative, who, in his capacity as superintendent of the ship station, is entitled to note the contents of all telegrams provided he has been placed by the Imperial Telegraph Administration, or, in the case of ships that are permanently abroad, by a German Consulate (General or Vice-consulate), under the obligation of preserving the secrecy of correspondence.

10. The certificate may be withdrawn if, in the case of any offences against the "Regulations for the Radiotelegraph Service," the operator has been found guilty after an inquiry.

11. If it is shown that the offence is due to the condition of the apparatus or to instructions given to the operator, the same procedure will be followed in respect of the license issued to the ship.

12. The certificate may also be withdrawn if it is stated by an officer of the Imperial Telegraph Administration that the operator is no more in possession of the prescribed knowledge and skill. In the latter case a certificate will be granted to the operator after he has successfully passed a further examination.

13. Every change in the staff of the ship station must be reported immediately to the local post office of the home port.

14. The ship station is bound to interchange radiotelegrams with every coast station and with every other ship station, without regard to the particular system of radiotelegraphy employed.

15. The Radiotelegraph Service is regulated in accordance with the rules in the "Instructions for the Radiotelegraph Service." In addition, special instructions which may be issued by the Imperial Telegraph Administration must be observed also.

. . . . .

22. The ship station must be in possession of the certificate from the Imperial Telegraph Administration, stating that the installation and the working of the station have been licensed by the authority named and the category in which the station is placed. This certificate must be kept in the station and presented upon the request of the authorities of the countries at the ports at which the ship calls.

23. If transfers the service of the ship wireless station to a contractor it is incumbent on that the conditions laid down are fulfilled by the contractor.

Place

Date

(Signature)

CONDITIONS FOR THE FITTING AND WORKING OF WIRELESS INSTALLATIONS ON AEROPLANES.

D 1. The license for the fitting and working of wireless installations on is issued on condition that it may be withdrawn. A transfer of the license to a third party is inadmissible.

2. As a rule the installation may communicate only with the nearest wireless station set aside for the air service, for the exchange of messages relating to the running and the safety of the aeroplanes. The transmission of other messages, either against payment or without payment, is not permitted.

In cases of emergency the aeroplanes are permitted to enter into communication with other wireless stations. In such cases the general emergency call is to be used.

3. For purposes of transmission the station must only use as much energy as is absolutely necessary to achieve its purpose.

4. The station must only be run with the use of a definitely prescribed wave. This wave must be undamped (continuous) and must be tuned as sharply as is possible according to the development of technical science.

The waves of 300, 450 and 600 metres reserved for general communication may only be used in cases of emergency.

5. Transmission restrictions and other working regulations (for instance, the distribution of waves, call letters and the divisions of time, etc.) are issued in a special enclosure and must be strictly adhered to.

6. The general public communications and the working of the army and navy wireless stations must not be interfered with.

7. The application for a license must be accompanied by indications regarding the working conditions of the proposed installation, and these indications must be recognised by the applicant after their examination by the State Ministry of Posts. Deviations from the indications require the approval of the State Ministry of Posts.

8. For purposes of supervision the officials of the State Telegraph Administration must be allowed to inspect the aeroplanes at the landing-places, and to acquaint themselves with the apparatus fitted for the execution of the wireless service.

9. The owner of the station is obliged, with full responsibility to see to it that all telegrams which may be received by the station from other wireless stations, shall be kept secret under all circumstances.

10. The owner of the plant is liable for any damages which may result from the working of the station ; he is also responsible for guarding the station and for preventing its use by unauthorised persons.

11. The demand of the State Telegraph Administration or of its officials, to suspend the working of the station temporarily, must be obeyed without delay. During the period of suspension the working plant—apparatus, aerials, etc.—or parts of them, must be removed to such an extent that employment of the station is out of the question. The decision regarding this point rests with the State Telegraph Administration.

12. The owner of the station undertakes to pay a yearly fee of twenty marks, by way of compensation for the costs of administration to the State Administration of Posts and Telegraphs.

13. The right of adding to or of altering the foregoing condition remains strictly reserved. The owner of the station is obliged to observe immediately and at his own cost any further conditions laid down by the State Telegraph Administration.

Approved.

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Signature.

CONDITIONS FOR THE INSTALLING AND WORKING OF WIRELESS STATIONS FOR EXPERIMENTAL PURPOSES.

E 1. The license for the installing and working of wireless stations is issued on condition that it may be withdrawn. A transfer of the license to a third party is inadmissible.

2. The letter of approval is accompanied by an indication regarding the working conditions of the proposed station, and the owner of the station must recognise this indication. The station may only be erected and worked in accordance with the indications. Deviations from the text of the indications need the approval of the State Ministry of Posts.

3. The station may only be used for experiments in connection with wireless and for the transmission of messages serving the purposes of such trials. The transmission of other messages, either against payment or without payment, is not permitted.

4. For purposes of transmission the station must only use as much energy as is absolutely necessary to achieve its purpose. The waves must be tuned as sharply as is possible according to the development of technical science.

5. Transmission restrictions and other working regulations (for instance, the distribution of wavelengths, call letters and the divisions of time, etc.) will, in case of necessity, be issued in a special enclosure, and must be strictly adhered to.

6. The general public communications and the working of the army and safety-police stations must not be interfered with.

7. The station must be constructed and permanently maintained in such a manner, that there can be no contact with or disturbing influence on State telegraph and telephone lines. Eventual expenses resulting from the removal of such interferences are to be born by the owner of the station.

8. The officials of the State Telegraph Administration have the right to enter the rooms in which the wireless plant or parts of the plant have been installed, and to acquaint themselves with the apparatus installed for the purpose of carrying out the experiments.

9. The owner of the station is obliged, with full responsibility, to see to it that all telegrams which may be received by the station from other wireless stations, shall be kept secret under all circumstances. In case of contravention the license will be withdrawn.

10. The owner of the station is liable for any damage which may result from the working of the station. He is also responsible for guarding the station and for the prevention of illegal use being made of the station by unauthorised persons.

11. The demand of the State Telegraph Administration or of its officials, to suspend the working of the station temporarily, must be obeyed without delay. During the period of suspension the working plant—or parts of them—must be removed to such an extent that the employment of the station is out of the question. The decision regarding this point rests with the State Telegraph Administration.

12. The owner of the station undertakes to pay the State Administration of Posts and Telegraphs a yearly fee of forty marks.

13. The right of adding to or of altering the foregoing conditions remains reserved. The owner of the plant is obliged to observe immediately and at his own cost any alteration of or addition to the conditions.

Approved.

....1921.

Signature.

CONDITIONS FOR THE ERECTION AND WORKING OF WIRELESS RECEIVING STATIONS FOR EXPERIMENTAL PURPOSES.

1. The license for the erection and working of wireless receiving stations at is issued on condition that it may be withdrawn. A transfer of the license to a third party is inadmissible.

2. The station may only be used for experiments in connection with wireless and for the reception of messages serving the purposes of such experiments. The transmission of other messages, either against payment or without payment, is not permitted.

3. It is forbidden to erect in the wireless receiving station any kind of transmitting apparatus.

4. The station must be constructed and

permanently maintained in such a manner, that there can be no contact with or disturbing influence on State telegraph and telephone lines. Eventual expenses resulting from the removal of such interferences are to be born by the owner of the station.

5. The application for the license must be accompanied by indications regarding the working conditions of the proposed plant, and these indications must be recognised by the applicant after their examination by the State Ministry of Posts. Deviations from the text of these indications need the approval of the State Ministry of Posts.

6. For purposes of supervision the officials of the State Telegraph Administration must be allowed to enter the rooms in which the apparatus are worked, and to acquaint themselves with the apparatus for the purpose of carrying out the experiments.

7. The owner of the station is obliged, with full responsibility, to see to it that all telegrams which may be received by the station from other wireless stations, shall be kept secret under all circumstances. In case of contravention the license will be withdrawn.

8. The owner of the installation is responsible for eventual damages which may result from the working of the installation; he is also responsible for guarding the station and for the prevention of use being made of the station by unauthorised persons.

9. The demand of the State Telegraph Administration or of its officials, to suspend the working of the station temporarily, must be obeyed without delay. During the period of suspension the working plant—apparatus, aerials, etc.—or parts of them, must be removed to such an extent that the employment of the station is out of the question. The decision regarding this point rests with the State Telegraph Administration.

10. The owner of the station undertakes to pay the State Administration of Posts and Telegraphs a yearly fee of twenty marks by way of compensation of the cost of administration.

11. The right of adding to or altering the foregoing conditions remains reserved. The owner of the plant is obliged to observe immediately and at his own cost any further conditions laid down by the State Telegraph Administration.

Approved.

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Signature.

CONDITIONS FOR THE ERECTION AND WORKING OF WIRELESS RECEIVING STATIONS FOR THE RECEPTION OF THE NAUEN TIME SIGNALS.

F 1. The license for the erection and working of the wireless receiving station

is issued on condition that it may be withdrawn. A transfer of the license to a third party is inadmissible.

2. The station may only be used for the reception of the time signals transmitted by Nauen on a 3,900 m. wave. The right of changing this wave remains reserved.

3. The station must comply with the following technical demands :—

(*a*) The aerial must not be larger, and the coupling between the aerial and the detector circuit must not be closer than is needed for the intended reception.

(*b*) The separate parts of the oscillating circuit—also of the aerial circuit—must be connected permanently by means of soldering; exceptions to this rule are only permitted at the connecting terminals of the detector and of the telephone receiver.

(*c*) The soldered joints must be placed in a case containing all the apparatus, and which can be closed by means of seals in such a manner that the owner of the license has access only to the connecting terminals of the detector and the telephone receiver. For the aerial leads outside this closed portion wire must be used enclosed in a firm and unbroken insulating tube.

(*d*) Any subsequent addition of leads or tuning instruments is forbidden.

4. It is forbidden to fit any kind of transmitting apparatus in the receiving plant.

5. The station must be constructed and permanently maintained in such a manner, that there can be no contact with or disturbing influence on any State telegraph or telephone lines. Eventual expenses resulting from the removal of such interferences shall be borne by the owner of the station.

6. The application for the license must be accompanied by indications regarding the working conditions of the proposed plant, and these indications must be recognised by the applicant after their examination by the State Ministry of Posts. Deviations from the text of these indications need the approval of the State Ministry of Posts.

7. For purposes of supervision the officials of the State Telegraph Administration must be permitted to enter the rooms in which the apparatus are worked, and to acquaint themselves with the apparatus belonging to the station.

8. The owner of the station is obliged, with full responsibility, to see to it that all telegrams which may be received by the station from other wireless stations, shall be kept secret under all circumstances. In case of contraventions the license will be withdrawn.

9. The owner of the station is liable for all damages which may result from the working of the station ; he is also responsible for guarding the station and for the prevention of its employment by unauthorised persons.

10. The demand of the State Telegraph Administration or of its officials, to suspend the working of the station temporarily, must be obeyed without delay. During the period of suspension the working plant—apparatus, aerials, etc., or parts of them—must be removed to such an extent that the employment of the station is out of the question. The decision regarding this point rests with the State Telegraph Administration.

11. The owner of the station undertakes to pay the State Administration of Posts and Telegraphs a yearly fee of forty marks by way of compensation for the costs of administration.

12. The right of adding to or altering the foregoing conditions remains reserved. The owner of the station is obliged to observe immediately, and at his own cost, any further conditions laid down by the State Telegraph Administration.

Approved.

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Signature.

CONDITIONS FOR THE ERECTION AND WORKING OF WIRELESS STATIONS (TRANSMITTING AND RECEIVING STATIONS) FOR OVERLAND POWER STATIONS, WATERWORKS, ETC.

G 1. The license for the erection and working of wireless stations at and

is issued on con-

dition that it may be withdrawn. A transfer of the license to other persons is inadmissible.

2. The stations must be erected at the expense of the (name of the company) and must remain their property.

3. The stations may only be erected in the form of small stations. They may only be used for inter-communication and may only transmit such urgent telegrams as refer to the working of the power station and the wireless stations belonging to it. The transmission of other telegrams, either against payment or without payment, is not permitted.

4. The energy used for transmission must not exceed the amount needed to carry out the purpose of the station. The power supplied to the wireless apparatus must, under normal conditions, not exceed 10 watt, measured at the terminals of the generator.

5. The station may only be worked with the use of a definitely prescribed wave. This wave must be continuous and must be tuned as sharply as is possible according to the development of technical science.

6. Transmission restrictions and other working regulations (for instance, the distribution of waves, call letters, the division of time, etc.) will be issued, in case of necessity, in a special enclosure, and must be strictly adhered to.

7. It is forbidden to fit any kind of transmitting apparatus on wireless stations which are to be used for receiving purposes only.

8. The general public communications, as well as the working of the army and navy stations, must not be interfered with.

9. The station must be constructed and permanently maintained in such a manner, that there can be no contact with or disturbing influence on State telegraph and telephone lines. Eventual expenses resulting from the removal of such interferences are to be born by the owner of the station.

10. The application for the license must be accompanied by indications regarding the working conditions of the proposed station, and these indications must be recognised by the applicant after their examination by the State Ministry of Posts. Deviations from the text of these indications need the approval of the State Ministry of Posts.

11. For purposes of supervision the officials of the State Telegraph Administration must be permitted to enter the rooms in which the apparatus are worked, and to acquaint themselves with the apparatus fitted for the execution of the experiments.

12. The owner of the station is obliged, with full responsibility, to see to it that all telegrams which may be received by the station from other wireless stations, shall be kept secret. In case of contraventions the license will be withdrawn.

13. The owner of the station is liable for any damage which may result from the working of the station. He is also responsible for guarding the station and for the prevention of its employment by unauthorised persons.

14. The demand of the State Telegraph Administration and of its officials, to suspend the working of the station temporarily, must be obeyed without delay. During the period of suspension the working plant—apparatus, aerials, etc.—or parts of them, must be removed to such an extent that the employment of the station is out of the question. The decision regarding this point rests with the State Telegraph Administration.

15. The owner of the station undertakes to pay the State Administration of Posts and Telegraphs a yearly fee of marks by way of compensation for the loss of charges on telegrams and for costs of administration.

16. The right of adding to or altering the foregoing conditions remains reserved. The owner of the plant is obliged to observe immediately and at his own cost any further conditions laid down by the State Telegraph Administration.

Approved.

....19...

Signature.

GIBRALTAR

(See map on page 480.)

PERHAPS nowhere in the world has more romance been crowded into a tiny piece of territory than is the case with the rocky promontory, 2½ miles long by ¾ mile broad, which we know as Gibraltar. Its name (*Gebel-Tarik*, the Rock of Tarik, a famous Mohammedan Conqueror) is simply crystallised history. British since 1713, its famous 3½ years' siege ended in 1783.

CONTROL.

In this essentially naval and military station, the Commander-in-Chief acts as Governor, exercising autocratically both administrative and legislative functions.

ORGANISATION.

There are no commercial wireless telegraph stations in Gibraltar, and the right to use wireless telegraphy is reserved to the Government. Private wireless of any description, whether amateur, commercial, or experimental, is strictly forbidden; not only the control, but the possession and working of radiotelegraphy, being exclusively vested in military or naval hands. At the present time there are three stations in existence, one for public service to ships and two used for Government traffic only.

ADMINISTRATION.

The Ordinance to prohibit importation, keeping, use or establishment of any apparatus or installation for transmission of messages by wireless telegraphy by unauthorised persons in Gibraltar came into force on October 20th, 1903. This Ordinance has been amended by the Wireless Telegraph Apparatus Amendment Ordinance, 1909 (February 3rd), and in the text below the amending words are shown in brackets :—

We print below the ruling Ordinances and Regulations :—

- **A**—Wireless Telegraph Apparatus Ordinance, 1903.
- **B**—Wireless Telegraph Apparatus Further Amendment Ordinance, 1909.
- **C**—Rules as to use on Merchant Ships.
- **D**—Ship License.
- **E**—Ordinance as to Wireless Telegraphy on Ships.
- **F**—Further Rules as to Use on Merchant Ships.

A 1. This Ordinance may be cited as "The Wireless Telegraph Apparatus Ordinance, Gibraltar, 1903."

2. No person shall import, keep, use or establish in Gibraltar [*or on board any British ship registered in Gibraltar*] any apparatus or installation for the receipt or transmission of messages by wireless telegraphy without the license in writing of the Governor, and under such terms and conditions as may be prescribed in such license, which license the Governor may in his discretion at any time cancel and revoke.

3. It shall be lawful for the Governor by order in writing to authorise the Chief of Police or any other person named by him in such order to enter at any time by day or night and by force, if necessary, any premises or place [*or any ship*] in Gibraltar, and to search for any such apparatus or installation as described in this Ordinance, and to seize and remove the same to be dealt with in such manner as the Governor may direct.

4. Any person offending against this Ordinance, or resisting or in any way interfering with any person charged with the execution of an order issued by the Governor under the preceding section, may be arrested without warrant and shall be liable on conviction by a Court of Summary Jurisdiction to a penalty not exceeding £50, or to imprisonment with or without hard labour for any term not exceeding three months.

5. All penalties under this Ordinance shall be recoverable summarily in manner directed by "The Justices Ordinance, Gibraltar, 1890."

B The "Wireless Telegraph Apparatus Further Amendment Ordinance, Gibraltar, 1909" (April 30th), contains the following clause :—

2. A person shall not work any apparatus for wireless telegraphy installed on merchant ships, whether British or foreign, while in Gibraltar otherwise than in accordance with rules made in that behalf by the Governor, and the Governor may, by any such rules, impose penalties recoverable summarily for the breach of any such rules, not exceeding £10 for each offence, and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ships. All such rules shall be published in the Official Gazette and after such publication shall have the same force and effect as if enacted in this Ordinance.

C The following rules as to the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in Gibraltar, were made on May 3rd, 1909, under "The Wireless Telegraph Apparatus Further Amendment Ordinance, Gibraltar, 1909":—

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of Gibraltar shall be worked in such a way as not to interfere with (*a*) Naval signalling, or (*b*) the working of any wireless telegraph station lawfully established, installed or worked in Gibraltar or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of Gibraltar, except with the special or general permission in writing of the Governor.

3. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. Any person offending against any of these rules shall be liable to a penalty not exceeding ten pounds for each offence recoverable summarily under "The Justices Ordinance, Gibraltar, 1890," and any apparatus for wireless telegraphy installed or worked on such ship may be forfeited to His Majesty.

LICENSE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATIONS.

D To all to whom these Presents shall come.

I,.................., Governor of the City and Garrison of Gibraltar send greeting :

Whereas Messrs..........., of .... (hereinafter called the licensee) is desirous of

establishing, installing, working and using, in a ship belonging to the licensee to wit the ...... wireless telegraphy:

And Whereas by reason of the provisions of the Summary Conviction Ordinance, 1885, it is unlawful to establish, keep or use in Gibraltar or on board any British ship registered in Gibraltar any apparatus or installation for the receipt or transmission of messages by wireless telegraphy without the license in writing of the Governor and under such terms and conditions as may be prescribed in such license.

And Whereas at the request of the licensee I have agreed to grant to the licensee the licenses, powers and authorities hereinafter expressed and contained for the period and upon the terms and subject to the stipulations and conditions hereinafter appearing:

Now, I, the above-named.......... Governor of the City and Garrison of Gibraltar, in exercise of all powers and authorities enabling me in this behalf, do hereby grant to the licensee, during the term or period commencing on the day of the date hereof and until these presents and the licence or permission hereby given shall be determined or revoked, license and permission,

(i) to establish, instal and work for the purposes hereinafter mentioned on board the steamship .... apparatus for wireless telegraphy (which apparatus is hereinafter referred to as "the licensed apparatus");

(ii) to send and receive messages by means of the licensed apparatus between the said steamship .... and coast stations and other ship stations.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:—

1. The provisions of the Imperial Telegraph Acts, 1863 to 1916, and the Regulations made thereunder shall be deemed to apply to this license and on any breach thereof this license shall be null and void.

2. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912, the Service Regulations made thereunder and any modification of the Convention or Regulations made from time to time.

3. The licensee shall, except as set out hereinafter, use the licensed apparatus solely on behalf and in the course of the business of the licensee and the licensee shall not receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

4. The licensee shall so far as possible receive from ships and lights stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

Given under my hand and seal at Gibraltar this............day of............19..

AN ORDINANCE TO MAKE PROVISION WITH RESPECT TO WIRELESS TELEGRAPHY ON SHIPS.

November 8th, 1920.

Be it enacted by His Excellency the Governor of the City and Garrison of Gibraltar, as follows:—

1. (1) Every seagoing British ship registered in Gibraltar being a passenger steamer or a ship of sixteen hundred tons gross or upwards shall be provided with a wireless telegraph installation, and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this Ordinance, and shall be provided with one or more certified operators and watchers, at least, in accordance with those rules:

Provided that the Governor may exempt from the obligations imposed by this Ordinance any ships or classes of ships if he is of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

(2) The Governor shall make rules prescribing the nature of the wireless telegraph installation to be provided, of the services to be maintained, and the number, grade, and qualifications of operators and watchers to be carried:

Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Imperial Merchant Shipping (Convention) Act, 1914.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but, if the offence is prosecuted summarily, the fine shall not exceed one hundred pounds.

(4) The Governor shall appoint a surveyor of ships or a wireless telegraphy inspector who may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Ordinance and for the purpose of that inspection such surveyor or inspector shall have all the powers of a Board of Trade inspector under the Imperial Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the Governor to the Treasurer and Collector at Gibraltar, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Ordinance.

(5) The obligations imposed by this Ordinance shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by the Imperial Wireless Telegraphy, Act, 1904, or any Order-in-Council, or regulations made thereunder, or by the Imperial Merchant Shipping (Convention) Act, 1914.

2. The foregoing provisions of this Ordinance shall, as from a date three months after the coming into operation of the obligations imposed by this Ordinance on British ships registered in Gibraltar, apply to ships other than British ships registered in Gibraltar while they are within the port of Gibraltar in like manner as they apply to British ships so registered.

3. (1) This Ordinance may be cited as the Merchant Shipping (Wireless Telegraphy) Ordinance, 1920, and shall come into operation on the first day of December, 1920.

(2) This Ordinance shall be construed as one with the Merchant Shipping Ordinance,

1886, and "passenger steamer" shall mean a steamer which carries more than twelve passengers.

Passed, 8th November, 1920.

By Command,

Colonial Secretary.

RULES MADE BY THE GOVERNOR UNDER THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ORDINANCE, 1920.

Interpretation.

1. In these Rules—

The expression "coasting trade" means trade between such ports as would constitute the vessel a "home trade ship" as defined in the Merchant Shipping Ordinance, 1886.

The number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

Classification of Ships.

2. For the purposes of these Rules ships shall be classified as follows:—

Class I—Ships carrying 200 persons or more which are not engaged in the coasting trade.

Class II—Ships not engaged in the coasting trade carrying 50 but less than 200 persons and ships engaged in the coasting trade carrying 50 persons or more.

Class III—Ships carrying less than 50 persons.

In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

Nature of Installation.

3. The installation shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention of Safety of Life at Sea, 1914), or of any international agreement by which the said Convention of 1912 may be superseded.

4. The installation shall be of the spark or interrupted continuous wave type.

5. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this rule as to emergency installations as well as those as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 nautical miles by day under normal conditions and circumstances.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and such independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this rule an installation shall be deemed to comply with the above requirements as to range if it is able to maintain communication on a 600 metre wave at a range of one and a half times the number of nautical miles hereinbefore respectively prescribed over sea by day with a Post Office Standard Station when employing a receiver without amplification devices.

6. There shall be provided between the bridge and the wireless telegraph room means of communication by voice pipe, telephone or other means and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

Ships not fitted with Approved Automatic Apparatus.

7. If not fitted with an approved automatic apparatus for registering the signal of distress—

(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall be always on watch:—

Nature of Voyage.	Number and Grade of Operators.
(a) Voyage exceeding 48 hours from port to port.	Three operators of whom one shall hold a First Grade Certificate, and not more than one a Third Grade Certificate.
(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	Two operators of whom one shall hold a First or a Second Grade Certificate.
(c) Voyage not exceeding 8 hours from port to port.	One operator who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Rules, and either a certificated operator or a certificated watcher shall always be on watch at other times.

Nature of Voyage.	Number and Grade of Operators and Watchers.
(a) Voyage exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade Certificate, and two watchers.
(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade Certificate, and one watcher.
(c) Voyage not exceeding 8 hours from port to port.	One operator who shall hold a First or a Second Grade Certificate.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade Certificate, and while at sea the operator shall always be on watch at the times specified in the Schedule to these Rules.

Ships Fitted with Approved Automatic Apparatus.

8. In the event of an automatic apparatus for registering the signal of distress being approved by the Governor a ship of Class III shall be fitted with such apparatus unless the duration of the voyage on which it is employed does not exceed eight hours from port to port, but in such a case the operator shall be on watch during the whole time of the voyage.

9. If fitted with automatic apparatus for registering the signal of distress approved as aforesaid:—

(i) A ship of Class I shall carry certificated operators in accordance with the following table and while at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by a certificated operator, or by a watcher, or by means of the approved automatic apparatus:—

Nature of Voyage.	Number and Grade of Operators.
(a) Voyage exceeding 48 hours from port to port.	Two operators, one of whom shall hold a First Grade Certificate.
(b) Voyage not exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade Certificate.

(ii) A ship of Class II shall carry one operator who shall hold a First or a Second Grade Certificate. and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade Certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, both of which have been approved by the Governor, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Rules.

Qualifications of Operators.

10. (1) Operators shall be graded into three grades in accordance with Rules to be made by the Governor and watchers shall be certificated by the Postmaster-General of the United Kingdom hereinafter called the Imperial Postmaster-General.

(2) Until graded in accordance with such Rules as aforesaid:—

(i) An operator who holds the Imperial Postmaster-General's First Class Certificate of Proficiency and who has had three years' experience as an operator may be employed as if he held a First Grade Certificate, but if an operator holding a First Grade Certificate is available an operator holding a First Class Certificate shall not be so employed on a ship of Class I which is required by these rules to carry three operators.

(ii) An operator who holds the Imperial Postmaster-General's First or Second Class Certificate of Proficiency and who has had one year's experience as an operator may be employed as if he held a Second Grade Certificate.

(iii) An operator who holds the Imperial Postmaster-General's First or Second Class Certificate of Proficiency and who has had less than one year's experience as an operator may be employed as if he held a Third Grade Certificate.

11. The Governor may accept in lieu of the certificate of the Imperial Postmaster-General certificates granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radiotelegraph Convention for the time being in force.

12. These Rules shall come into operation on the 1st day of December, 1920.

Given under my hand and seal at Gibraltar this day of

By Command,

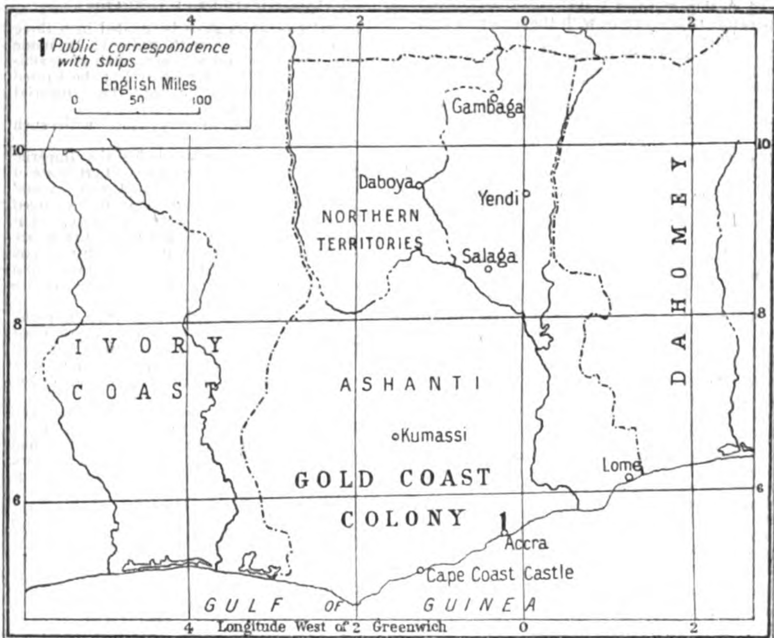
Colonial Secretary.

GILBERT AND ELLICE ISLANDS

(See Pacific Islands.)

GOLD COAST COLONY

THE Gold Coast Colony comprises the coast of the Gulf of Guinea from about longitude 3° 7′ W. to 1° 14′ E. of Greenwich; with a protectorate extending inland to an average distance of 440 miles or to the 11° of N. latitude. It is bounded on the west and north by the French Colonies of the Ivory Coast and French Sudan, and on the east by the ex-German colony of Togoland. The natives are almost Pagans, but Mohammedanism and Christianity are steadily gaining ground. English merchants started trading at Kormantyne on this coast in 1618, and Chartered Companies subsequently took up the task of organising British trade. Their settlements were in 1821 transferred to the Crown, and a separate establishment under the title of Gold Coast Colony was created in 1874. The seat of Government is at Accra, and the administration is conducted by a Governor, aided by a nominated Executive Council and by a Legislative Council of six official and four unofficial members.



CONTROL.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
Mr. S. B. Gosling	Postmaster-General	Accra.
Major J. F. O'Shaughnessy	Engineer-in-Chief of Posts and Telegraphs Dept.	Do.
Mr. L. C. C. Miles	Operator	Do.
Mr. A. W. Spurling	Do.	Do.

ORGANISATION.

Radiotelegraphy was introduced in 1912, and in 1913 the Accra station was completed.

There are no privately owned experimental or amateur stations; neither are there any wireless clubs or societies. In fact no licenses have been issued to any classes of individual or corporations, radiotelegraphy in this Colony being still in its infancy.

ADMINISTRATION.

The first Act to regulate radiotelegraphy in this Colony was "The Wireless Telegraphy Ordinance, 1903." This was followed by "The Wireless Telegraphy (Amendment) Ordinance, 1913" (see the Wireless Year-Book for 1915). These Ordinances, however, were both of them repealed by "The Wireless Telegraphy Ordinance No. 15 of 1913," which is the extant Government Ordinance as at present administered, and the text thereof will be found below.

Annexed to this Ordinance are regulations applying to Merchant Ships, whereof the text appears below. In 1917 the Government promulgated Rules

for the Regulation of Wireless Telegraphy within its territorial waters. These rules also figure in the following pages :—

The Laws and Regulations here printed are :—

A—Wireless Telegraphy Ordinance No. 15 of 1913 (dated October 4th, 1913).
B—Regulations (Merchant Ships).
C—Rule No. 17 of 1917.

A An Ordinance (No. 15) to provide for the regulation of Wireless Telegraphy, 4th October, 1913.

Be it enacted by the Governor of the Gold Coast Colony, with the advice and consent of the Legislative Council thereof, as follows :—

1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraphy without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions, and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the Colonial waters otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made undre the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the Colonial waters shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate or District Commissioner is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under this Ordinance, he may grant a search warrant to any Commissioner or Assistant Commissioner of Police or any person appointed in that behalf by the Commissioner of Police and named in the warrant, and a warrant so granted shall authorise the Commissioner or Assistant Commissioner of Police or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before a District Commissioner's Court on the complaint of a Commissioner or Assistant Commissioner of Police or of any person thereto authorised by the Commissioner of Police in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraphy Ordinance, 1903, and the Wireless Telegraphy (Amendment) Ordinance, 1913, are hereby repealed.

REGULATIONS.

B (i) All apparatus for wireless telegraphy on board a merchant ship in the Colonial waters shall be worked in such a way as not to interfere with—

(*a*) Naval signalling, or

(*b*) The working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the Colonial waters and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(ii) In these regulations "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

(iii) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour, port or bay of the Colony except with the special or general permission of the Governor.

(iv) For the purpose of any proceedings under these regulations the master or person being, or appearing to be, in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(v) Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being

or appearing to be, in command or charge of the ship.

(vi) These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

RULE No. 17 OF 1917.

Under and by virtue of section 8 of the Defence of the Colony Ordinance, 1914, I, Sir Hugh Charles Clifford, Knight Commander of the Most Distinguished Order of Saint Michael and Saint George, Governor and Commander-in-Chief of the Gold Coast Colony, with the advice of the Executive Council of the said Colony, do hereby make the following rules which I, with the advice aforesaid, consider necessary for the public safety and the Defence of the Colony.

1. The radiotelegraphic stations on board ships (other than His Majesty's ships of war) shall not be worked, except for the reception of messages whilst such ships are within any harbour, port or within any roadstead within the Colonial waters of the Colony.

2. For the proper enforcement of the last preceding rule.

(*a*) The master of every ship of British or Allied register whilst in any such harbour, port or roadstead shall cause the sending and transmitting portion of the radio apparatus on such to be disconnected and to be kept disconnected from the dynamo, accumulators, or other source of electrical power available, so that radio messages cannot be sent from the ship.

(*b*) If an officer appointed in writing by the Postmaster-General to examine the wireless apparatus on any ship shall so order, the master of such ship within such harbour, port or roadstead shall cause all portions of the radio apparatus on such ship to be disconnected or sealed in such manner as such officer shall order, and shall cause the same to be kept so disconnected or sealed while such ship is within such harbour, port or roadstead.

(*c*) The master of a ship of neutral register shall immediately on arrival in any such harbour, port or roadstead cause the aerial wires to be taken down completely and disconnected from the radiotelegraph apparatus on such ship and shall cause such wires to remain so down and disconnected while such ship is in such harbour, port or roadstead, and shall cause the operating room to be sealed and kept sealed and such other steps to be taken as any officer appointed by the Postmaster-General for the purpose may order.

Made at a meeting of the Executive Council held at Government House, Accra, this 1st day of September, 1917.

(Signed) HUGH CLIFFORD,
Governor.

GREAT BRITAIN

THE total area of the British Isles is reckoned at 121,377 square miles, whilst in 1921 the population numbered 42,767,530.

Our own country is proud to share with Italy in the production of Senatore Marconi. England has been the chief scene of his labours. The first British patent for Wireless Telegraphy was No. 12,039, lodged by the Italian inventor in 1896. Ever since that date Great Britain has been in the forefront of wireless activities, and British radio telegraphy is continually expanding in all directions.

CONTROL.

The Postmaster-General is responsible for the administration of wireless telegraphy in Great Britain.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Rt. Hon. F. G. Kellaway, M.P. ..	Postmaster-General	General Post Office, London, E.C.
Sir George Evelyn P. Murray, K.C.B...	Secretary to Post Office.. ..	Ditto.
Mr. F. J. Brown, C.B.E., M.A., B.Sc...	Assistant Secretary to Post Office	Ditto.
Mr. J. I. De Wardt, O.B.E.	Principal	Ditto.

DEPARTMENT OF THE INSPECTOR OF WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Comdr. F. G. Loring, R.N., M.I.E.E...	Inspector of Wireless Telegraphy	General Post Office, London, E.C.
Lt.-Col. C. G. G. Crawley, R.M.A., M.I.E.E.	Deputy Inspector of Wireless Telegraphy.	Ditto.
Mr. E. Addey, B.Sc. (Lond.), M.I.E.E., Fellow I.R.E.	Assistant Inspector of Wireless Telegraphy.	Ditto.
Comdr. R. L. C. Grattan, R.N., D.S.O.	Ditto	Ditto
Mr. S. E. J. Burrow	Ditto	Ditto

ORGANISATION.

Early in 1914 a Bill was presented to the House of Commons by the President of the Board of Trade to amend the laws relating to merchant shipping so as to give effect to the International Convention for the Safety of Life at Sea, signed at London on January 20th, 1914. Under the title "Merchant Shipping (Convention) Act, 1914," this Bill was passed in August, 1914, and was due to come into force on July 1st, 1915, but has not yet been put into operation. Part III of the Act refers to wireless telegraphy and is printed below.

Section 22 of the Defence of the Realm Regulations expired on August 31st, 1921.

A new Act—the Merchant Shipping (Wireless Telegraphy) Act, 1919—came into operation on September 1st, 1920. We print the Act and rules herewith.

Regarding experimental and private business stations, a new Wireless Telegraphy Bill is to be introduced into Parliament, and when this has been passed the various forms of experimental and private business license will be revised. In the meantime the General Post Office is issuing temporary experimental permits for (*a*) transmitting and receiving, and (*b*) receiving only, on the conditions stated below.

The partial removal of restrictions on amateur working which has already taken place was immediately productive of a keen stimulus to amateurism. The Wireless Society of London and kindred associations have resumed activities with more than pre-war ardour, and fresh societies are springing up in various parts of the country. (*For lists of Amateur and Experimental Societies, see the Amateur and Experimental Section of the Year-Book.*)

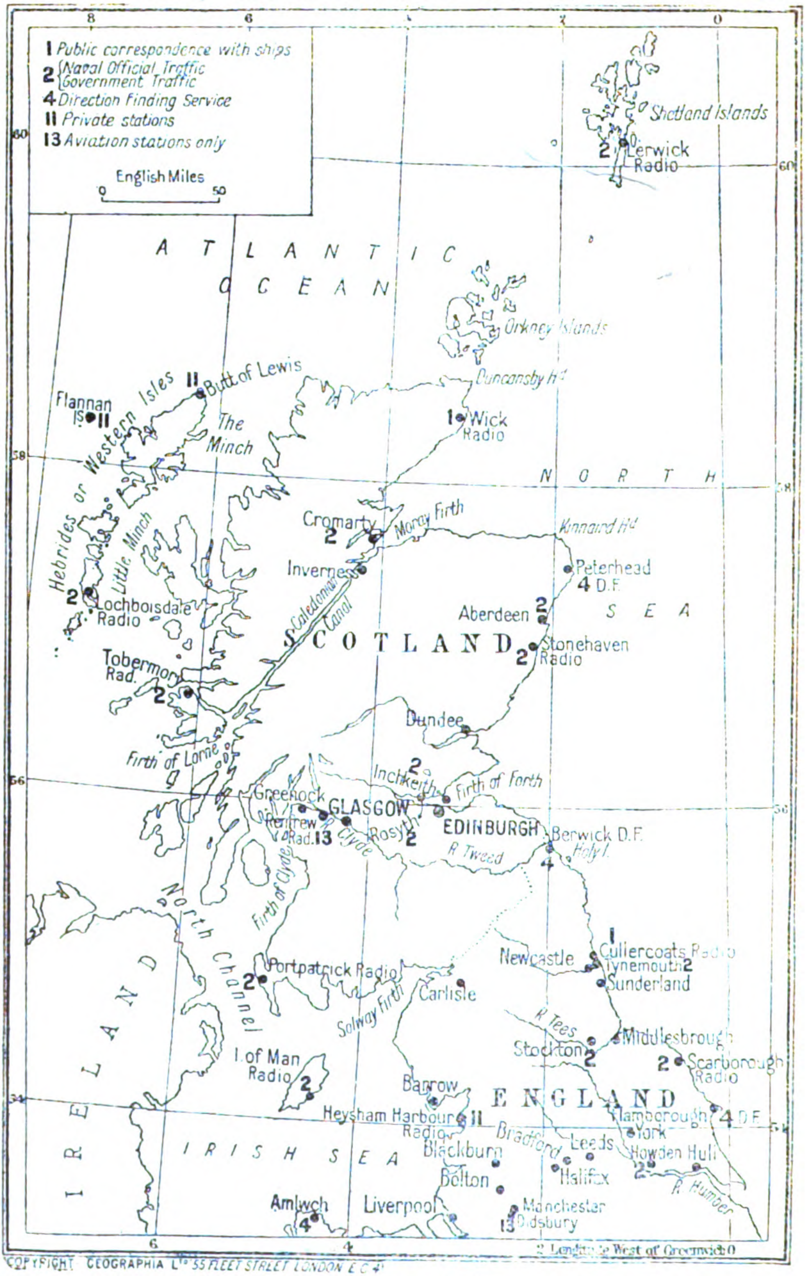
Under the Wireless Telegraphy Act, 1904, which we print below, it is unlawful to establish or work any wireless telegraph apparatus in any British aircraft, except under and in accordance with a license granted by the Postmaster-General. A form of license for the wireless installation on aircraft is reproduced below. The Syllabus of examination for certificate to act as wireless operator in aircraft is not yet definitely settled, but certificates in special cases are issued by the Post Office on the recommendation of the Air Ministry.

ADMINISTRATION.

The following is the list of items to be found below :—

A—Wireless Telegraphy Act, 1904.
B—Order in Council, February 29th, 1908.
C—Wireless Telegraphy (Foreign Ships) Regulations, 1908.
D—Ship Stations License.
E—Private Business License.*
F—Board of Trade Notice (Signalling Practice).
G—Merchant Shipping (Convention) Act, 1914. (Part III.)
H—Extracts from *London Gazette*, April 29th, 1919.
I—Circular to Owners and Masters of British Merchant Ships. (Part II.) Relaxation of Restrictions on Use of Wireless Telegraphy, dated November 22nd, 1919.
J—Merchant Shipping (Wireless Telegraphy) Act, 1919.
K—Rules made under Merchant Shipping (Wireless Telegraphy) Act.
L—Postmaster-General's authority for the use of Transmitting and Receiving Apparatus for Amateurs.
M—Postmaster-General's authority for the use of Receiving Apparatus only for Amateurs.

* The terms of this license are no longer operative, and a new form of license is likely to be issued shortly.



Peterhead and Amlwch D.F. closed. Scarborough Radio closed.
Stonehaven Radio now official correspondence only.

N—Extract from Convention relating to International Air Navigation, 1919.
O—Form of License for Wireless on Aircraft.
P—Admiralty Notice to Mariners No. 524 of March 25th, 1920.
Q—Admiralty Notice to Mariners No. 838 of May 22nd, 1920.
R—Admiralty Notice to Mariners No. 952 of June 15th, 1920.
S—Air Ministry Notice to Airmen No. 103 of September 30th, 1920.

WIRELESS TELEGRAPHY ACT, 1904.

A Following the termination of the meeting of the delegates at the International Conference in Berlin in 1903, the British Government drafted a Wireless Telegraph Act to define the official position of the Postal and Telegraph Department in the United Kingdom in regard to the new development. The Act received Royal assent on August 15th, 1904, and the text is as follows:—

1. (1) A person shall not establish any wireless telegraph station, or instal or work any apparatus for wireless telegraphy, in any place or on board any British ship except under and in accordance with a license granted in that behalf by the Postmaster-General.

(2) Every such license shall be in such form and for such period as the Postmaster-General may determine, and shall contain the terms, conditions, and restrictions on and subject to which the licence is granted, and any such license may include two or more stations, places, or ships.

(3) If any person establishes a wireless telegraph station without a license in that behalf, or instals or works any apparatus for wireless telegraphy without a license in that behalf, he shall be guilty of a misdemeanour, and be liable, on conviction under the Summary Jurisdiction Acts, to a penalty not exceeding ten pounds, and on conviction on indictment to a fine not exceeding one hundred pounds, or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Act except by order of the Postmaster-General, the Admiralty, the Army Council, or the Board of Trade.

(4) If a justice of the peace is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within his jurisdiction without a license in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Postmaster-General, the Admiralty, the Army Council, or the Board of Trade, and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) Sections 684, 685, and 686, of the Merchant Shipping Act, 1894 (which relate to the jurisdiction of courts and justices), and section 693 of the same Act (which relates to distress for sums ordered to be paid by masters and owners of ships), shall apply to the jurisdiction of courts and justices in respect of ships, and to distress under this Act.

(6) The Postmaster-General may make regulations for prescribing the form and manner in which applications for licenses under this Act are to be made, and, with the consent of the Treasury, the fees payable on the grant of any such license.

(7) The expression "wireless telegraphy" means any system of communication by telegraph as defined in the Telegraph Acts 1863 to 1904, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received; Provided that nothing in this Act shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. (1) Where the applicant for a license proves to the satisfaction of the Postmaster-General that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted, subject to such special terms, conditions, and restrictions as the Postmaster-General may think proper, but shall not be subject to any rent or royalty.

(2) Where an applicant for a license satisfies the Postmaster-General that a wireless telegraph station is to be used solely for the transmission of telegrams which are within the first or second exception from the exclusive privilege of transmitting telegrams conferred upon the Postmaster-General by the Telegraph Act, 1869, a license for that purpose, if granted, shall not be subject to any rent or royalty.

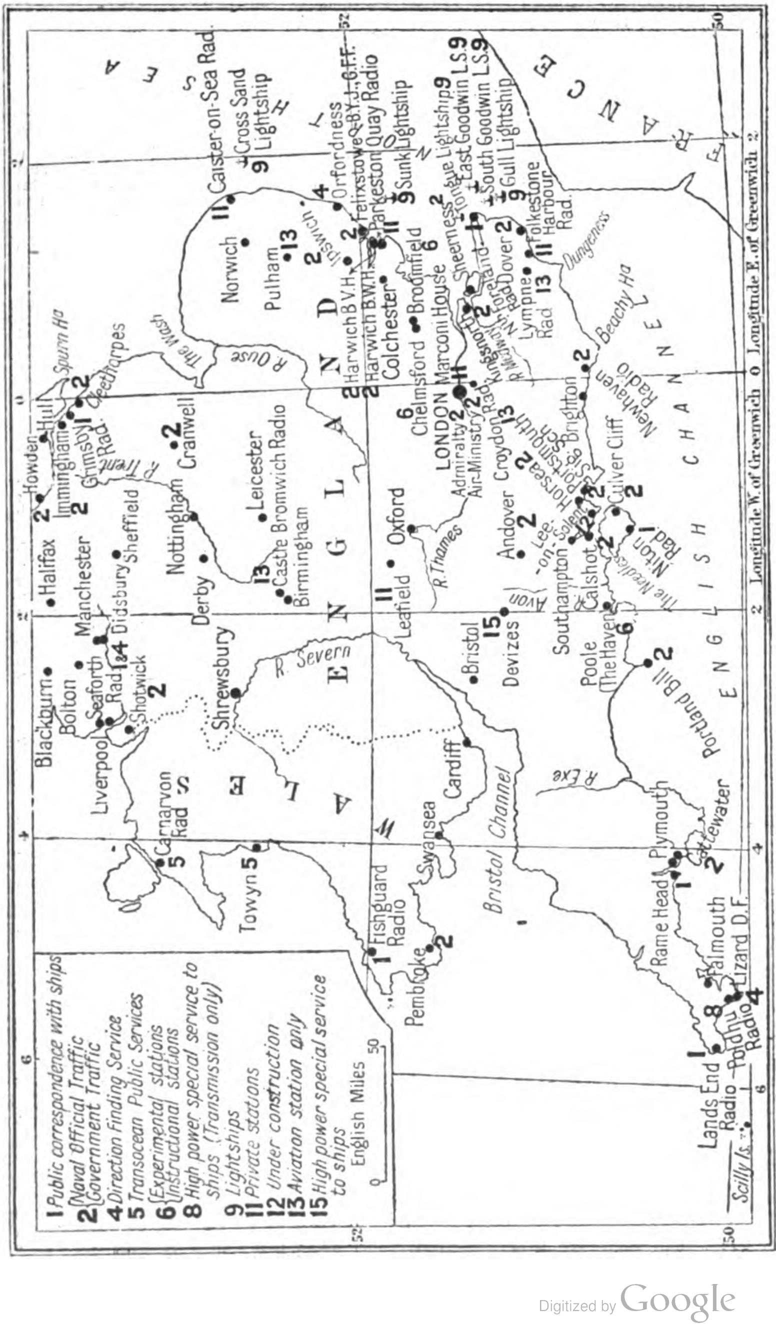
(3) It shall be lawful for the Postmaster-General, due regard being had to the maintenance and exercise of effective control over wireless telegraphy, to grant special licenses at reduced terms for the establishment and working of wireless telegraph stations to be used exclusively for the transmission within the United Kingdom of news to public registered newspapers. A schedule of all reduced rents or royalties imposed by any special licenses shall be laid before both Houses of Parliament within fourteen days of the commencement of the session next succeeding the grant of any such licenses.

3. (1) This Act may be cited as the Wireless Telegraphy Act, 1904, and may be cited with the Telegraph Acts, 1863 to 1904.

(2) This Act shall extend to the whole of the British Islands and to all British ships in the territorial waters abutting on the coast of the British Islands, and the Royal Courts of the Channel Islands shall register this Act accordingly.

(3) His Majesty in Council may order that this Act shall, subject to any conditions, exceptions, and qualifications contained in the order, apply during the continuance of the order to British ships whilst on the high seas.

(4) A person shall not work any apparatus for wireless telegraphy installed on a foreign ship whilst that ship is in territorial waters otherwise than in accordance with regulations


1 Public correspondence with ships
2 Naval Official Traffic
Government Traffic
4 Direction Finding Service
5 Transocean Public Services
6 Experimental stations
Instructional stations
8 High power special service to ships (Transmission only)
9 Lightships
11 Private stations
12 Under construction
13 Aviation station only
15 High power special service to ships
English Miles
Longitude W. of Greenwich 0 Longitude E. of Greenwich
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made in that behalf by the Postmaster-General, and the Postmaster-General may, by any such regulations, impose penalties recoverable summarily for the breach of any such regulations not exceeding ten pounds for each offence and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ship. Save as aforesaid, nothing in this Act shall apply to the working of apparatus for wireless telegraphy installed on any foreign ship.

4. In the application of this Act to Scotland the expression "Misdemeanour" means crime and offence.

5. In the application of this Act to the Channel Islands and the Isle of Man:—

(1) The Lieutenant-Governor of the Island of Jersey or the Island of Guernsey, and the Governor, Lieutenant-Governor, or Deputy-Governor of the Isle of Man, as the case may require, shall be substituted for the Board of Trade.

(2) Offences may be prosecuted, fines recovered, proceedings taken, and search warrants issued in such courts and in such manner as may for the time being be provided in the Channel Islands and the Isle of Man by law, or, if no express provision is made then in and before the courts and in the manner in which the like offences, fines, proceedings, and warrants may be prosecuted, recovered, taken, or issued therein by law, or as near thereto as circumstances admit, and the bailiff or his lieutenant, or any jurat of the Royal Court in the Island of Jersey or the Island of Guernsey, and the judge or any jurat of the Court of Alderney, and the high bailiff or two justices of the peace in the Isle of Man, shall respectively be substituted for a justice of the peace.

6. This Act shall continue in force until the thirty-first day of July, nineteen hundred and six, and no longer unless Parliament otherwise determines. (It was renewed until December 31st, 1909, and has since been extended from year to year by the Expiring Laws Continuance Act.)

B The following Order in Council is dated February 29th, 1908:—

(1) The Wireless Telegraphy Act, 1904, shall apply to British ships whilst on the high seas, provided that a person on board a British ship which is registered in any British possession (other than the Channel Islands and the Isle of Man), or in any British Protectorate, shall not be deemed to commit an offence against the Wireless Telegraphy Act, 1904, by reason of the installation or working of wireless telegraphy on such ship if the authority in such Possession or Protectorate, having power by law so to do, shall have granted a license for the installation and working of apparatus for wireless telegraphy on that ship, and if such person is acting in accordance with the provisions of such license.

(2) The Interpretation Act, 1889, shall apply for the purpose of the interpretation of this Order as it applies for the purpose of the interpretation of an Act of Parliament.

(3) This Order shall be published in the *London Gazette*, and shall come into operation immediately from and after the expiration of three months after this Order is so published.

(4) This Order may be cited as "The Wireless Telegraphy Order, 1908."

C An Order was issued in 1908 (No. 496) containing regulations relating to foreign ships:—

1. In these Regulations unless the context otherwise requires—

"Wireless Telegraphy" has the same meaning as in the Wireless Telegraphy Act, 1904.

"Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

"Territorial Waters" means such part of the sea adjacent to the coast of the British Islands as is deemed by international law to be within the territorial sovereignty of His Majesty, and includes harbours.

"Harbour" includes harbours properly so called, whether natural or artificial estuaries, navigable rivers, piers, jetties, and other works in or at which ships can obtain shelter, or ship and unship goods or passengers.

When communications are made by means of wireless telegraphy between a foreign ship in territorial waters and a wireless telegraph station in the British Isles, the rules in force for the working of wireless telegraphy at that station shall be observed.

3. All apparatus for wireless telegraphy on board a foreign ship in territorial waters shall be worked in such a way as not to interrupt or interfere with—

(*a*) Naval Signalling, or

(*b*) the working of any wireless telegraph station lawfully established, installed, or worked in the British Islands or the territorial waters abutting on the coast of the British Islands, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. (1) Except with the special permission in writing of the Postmaster-General no apparatus for wireless telegraphy on board a foreign ship (other than a ship of war) shall be worked or used whilst such ship is in any harbour in the British Islands.

(2) Without prejudice to the operation of the general provisions of these Regulations, the use of wireless telegraphy on board a foreign ship of war while in a harbour in the British Islands shall be subject to such rules (whether prohibitive or regulative) as may be made by the Admiralty from time to time.

5. (1) If at any time in the opinion of one of His Majesty's Principal Secretaries of State an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, and notice to that effect is published by the Postmaster-General, after the publication of such notice and until further notice the use of wireless telegraphy on board foreign ships whilst in territorial waters shall be subject to such rules as may be made by the Admiralty from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

(2) Such notice as aforesaid shall be published in the *London Gazette*, the *Edinburgh*

Gazette, and the *Dublin Gazette*, and in such other manner, if any, as to the Postmaster-General may seem fit.

6. (1) Any person who shall offend against any provision of these Regulations or of any Rules made by the Admiralty thereunder shall be liable on conviction under the Summary Jurisdiction Acts for every such offence to a penalty not exceeding ten pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy installed or worked on board the ship on which the offence was committed shall be seized and forfeited.

(2) For the purposes of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any foreign ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(3) Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

7. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

8. These Regulations shall come into operation on the first day of July, 1908.

9. These Regulations may be cited as "The Wireless Telegraphy (Foreign Ships) Regulations, 1908."

D The following is a copy of the form of License granted by the Postmaster-General to establish Wireless Telegraph Ship Stations :—

LICENSE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATIONS.

To all to whom these presents shall come

I, The Right Honourable

His Majesty's Postmaster-General send greeting :

Whereas by reason of the provisions of the Telegraph Acts 1863 to 1920 and the Wireless Telegraphy Order 1908 it is unlawful to establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any British ship (whether in the territorial waters of the British Islands or on the high seas) except under and in accordance with a license granted in that behalf by the Postmaster-General :

And whereas —— (hereinafter called the licensee) has applied to the Postmaster-General for the grant of a license to establish instal and work apparatus for wireless telegraphy as defined in Section 1 (7) of the Wireless Telegraphy Act 1904 at the ship station or stations mentioned in the Schedule hereto.

Now I the above-named —— His Majesty's Postmaster General in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the 31st day of December next and thereafter so long as the Wireless Telegraphy Act 1904 shall remain in force unless and until these presents and the license and permission hereby given shall be determined license and permission—

(i) To establish instal and work for the purposes hereinafter mentioned at the ship station or stations specified in the Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedule hereto (which apparatus is hereinafter referred to as "the licensed apparatus") :

Provided that—

(a) Each ship station shall comply in all respects with the provisions of any Rules from time to time made by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act 1919 ;

(b) The apparatus installed at each ship station shall be of the character specified in the said Schedule opposite to the name of such station ;

(c) The sending apparatus used at each ship station shall be of such a character that the waves emitted are as pure and as little damped as possible and the receiving apparatus used at the said station or stations shall be of such a character as to afford the greatest possible protection from disturbance during the reception of signals ;

(d) The licensed apparatus shall be so constructed as to be capable of using wavelengths of 600 and 300 metres in length as measured by the standard of measurement in use by the Post Office for the time being. The licensed apparatus may be so constructed as to use any of the wavelengths specified in columns 5 and 6 of the Schedule hereto or any wavelengths prescribed by any administration for communication with direction finding stations and such other wavelengths as may be authorised in writing from time to time by the Postmaster-General Provided always that the wavelength of 600 metres shall normally be used for communication and further that the wavelength of 1,800 metres may be used for transmission in the exceptional case contemplated by Article XXXV (2) (a) of the Service Regulations annexed to the Radiotelegraph Convention 1912 :

Provided further that only the wavelength of 600 metres (except as directed by the Admiralty) shall be used by the licensee during the period of any war in which the United Kingdom is engaged ;

(e) The apparatus shall admit of the transmission and reception of messages at the rate of not less than 20 words a minute five letters being counted as one word ;

(ii) To send and receive messages by means of the licensed apparatus between the said ship stations and also between the said ship stations and coast stations and other ship stations Provided that the licensee shall not except with the consent in writing of the Postmaster-General at any time send spoken messages from the said ship stations or send or receive messages from and at the said ship stations when in any harbour in the British Islands ; and

(iii) To receive money or other valuable consideration for or in respect of the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions :

1. In these presents (and in the Schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say) :—

The expression "the Postmaster-General" means the Postmaster-General for the time being.

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904.

The term "telegraph" has the same meaning as in the Telegraph Act 1869.

The expression "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether a coast station or a ship station.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

The expressions "the International Telegraph Convention" and "the International Telegraph Regulations" means respectively the International Convention of St. Petersburg dated the 10th/22nd July 1875 and the Service Regulations made thereunder and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraph Convention 1912" means the Convention signed at London on the 5th day of July 1912 and the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The expression "coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the despatch or receipt of messages except messages authorised by this license.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling.

(2) If the Admiralty are of opinion that the working of the licensed apparatus at any ship station specified in the Schedule hereto is inconsistent with the free use of Naval signalling the licensee shall when required in writing by the Postmaster-General so to do close the said station.

(3) These provisions for the protection of Naval signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

4. For the purpose of this license the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Telegraph Acts 1863 to 1920 by the Postmaster-General with the consent of the Treasury in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraph Convention 1912.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Postmaster-General from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensed apparatus shall not without the consent of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

9. The licensee shall keep the licensed apparatus and in particular the headgear receivers thereof in a clean and sanitary condition.

10. The licensee shall screen all lights emanating from the licensed apparatus in such manner as may be necessary to ensure the reasonable comfort and health of operators and watchers.

11. The licensee shall at all times indemnify the Postmaster-General against all actions claims and demands which may be brought or made by any corporation company or person in respect of any injury arising from any act licensed or permitted by these presents.

12. (1) Subject to the provisions of this license the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or preference whether as regards rates of charge order of transmission or otherwise. Provided always that signals of distress and messages in connection therewith shall receive priority over all other messages and that the order of transmission of such other messages shall be governed by the International Telegraph Regulations.

(2) In respect of messages transmitted on behalf of His Majesty's Government or the Government of any British Possession or Protectorate the licensee shall charge rates not in excess of half of the rates charged to the ordinary public.

13. The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

14. The licensed apparatus at each of the ship stations mentioned in the Schedule hereto shall be worked only by operators holding certificates issued by the Postmaster-General and the licensee shall provide for the working of each station such certified operators and watchers as are required by the provisions of any Rules from time to time made by the Board of Trade under the Merchant Shipping (Wireless Telegraphy) Act 1919.

15. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the ship stations specified in the Schedule hereto a copy of Section 11 of the Post Office (Protection) Act 1884 and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of this license entitling the Postmaster-General under Clause 21 hereof to revoke and determine this license.

16. The licensee shall keep full accounts records and registers of all messages transmitted by means of the licensed apparatus and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its place of origin and of ultimate destination and such further particulars as the Postmaster-General shall from time to time reasonably require to be shown messages on His Majesty's service being in such registers distinguished from other messages. The licensee shall preserve all used message forms written and printed and transcripts of messages and all other papers for a period of at least fifteen months counting from the month following that in which the radiotelegrams were handed in as prescribed by the Radiotelegraph Convention 1912 and such registers and message papers shall be open to the inspection of the Postmaster-General or his officers thereto authorised at the registered office of the licensee for the time being or at such other place as may be agreed between the hours of 10 a.m. and 5 p.m. on every day except Sunday or a statute or general holiday.

17. The licensee shall render to the Postmaster-General such accounts as the Postmaster-General shall direct in respect of all charges due or payable under the Radiotelegraph Convention 1912 in respect of messages exchanged between the ship stations hereby licensed and coast stations and shall pay to the Postmaster-General at such times and in such manner as the Postmaster-General shall direct all sums which shall be due from the icensee under such accounts.

18. The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the ship stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and us°r of such apparatus and telegraphic instruments respectively.

19. The licensee shall carry on every ship on which a ship station is established under this license a print or copy of the license certified under the hand of an appropriate officer of the Postmaster-General to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls. The licensee shall also carry on every such ship such documents as may be prescribed by the Postmaster-General for the purpose of enabling the licensee to communicate with coast stations and ship stations in accordance with the Radiotelegraph Convention 1912.

20. The licensee shall forthwith pay to the Postmaster-General for and in respect of the license hereby granted a sum of five shillings in respect of each ship station at which the licensed apparatus is installed and in addition thereto a sum of five shillings in respect of each such ship station on the first day of January in each year during which the license remains valid.

21. Except with the consent in writing of the Postmaster-General the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licenses powers or authorities hereby granted or any of such licenses powers or authorities.

22. (1) If and whenever an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for any Naval Military Customs or Police Officer or any other person authorised by the Admiralty to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to use the same for His Majesty's service and in that event any such officer or person so authorised may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent the use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised as aforesaid may in any such event as aforesaid instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may enter upon any ship on which any apparatus is installed accordingly or the said officer or person so authorised as aforesaid may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised as aforesaid may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

23. At any time after the 31st day of December 192 the Postmaster-General may in his absolute discretion give notice in writing to determine these presents and the license or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Postmaster-General under any condition or provision herein contained.

24. In any of the following cases (that is to say):—

(a) In case any sum of money which ought to be paid by the licensee to the Postmaster-General under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained

then and in any such case the Postmaster-General may by notice in writing under his seal revoke and determine these presents and the licenses powers and authorities hereinbefore granted and each and every of them as to all or any of the ship stations hereby licensed and thereupon these presents and the said license

powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said ship stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

25. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Postmaster-General from time to time to enter into agreements for or to grant licenses relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the United Kingdom by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Telegraph Acts or any of them.

26. Any notice request or consent (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of any officer of the Post Office duly authorised by him and may be served by sending the same in a registered letter addressed to the licensee at the registered office for the time being of the licensee or if such notice request or consent relates to any particular ship station by delivery to the master of the ship upon which such station is installed and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office London.

Lastly any license or permit heretobefore granted by the Postmaster-General to the licensee in respect of any of the ships specified in the Schedule hereto is hereby revoked.

As witness my hand and seal this day of one thousand nine hundred and .

Signed sealed and delivered by

On behalf of the Postmaster-General in the presence of

1	2	3	Character of Apparatus.			Power.		9
			4	Wavelengths (in Metres).		7	8	
Name of Ship on which Station established.	Call-Signal.	Normal Range of Signalling in Nautical Miles.	System of Radiotelegraphy with the Characteristics of the System of Emission.	5 Spark or Interrupted Continuous Wave.	6 Continuous Wave.	Source.	Maximum to be taken by Sending Instruments.	If Alternator is used, Number of Cycles per Second.
						Ship's mains.		

LICENSE TO USE WIRELESS TELEGRAPHY FOR PRIVATE BUSINESS.*

Whereas
E of in the county of (hereinafter called "the licensee") is desirous of establishing installing working and using a system of wireless telegraphy as defined in Section 1 (7) of the Wireless Telegraphy Act 1904:

And whereas by reason of the provisions of the Telegraph Acts 1863 to 19 it is unlawful to establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place except under and in accordance with a license granted in that behalf by the Postmaster-General and it is also unlawful save as in the said Acts provided to transmit telegrams within the United Kingdom:

And whereas at the request of the licensee I have agreed to grant to the licensee the licenses powers and authorities hereinafter expressed and contained for the period upon the terms and subject to the stipulations and conditions hereinafter appearing:

Now I the above-named His Majesty's Postmaster-General in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the 31st day of December 19 license and permission—

(i) to establish and instal and work at the stations specified in the Schedule hereto apparatus for wireless telegraphy (hereinafter called "the licensed apparatus") provided that the apparatus installed at each station shall be of the character specified in the said Schedule opposite to the name of such station; and

(ii) to transmit and receive messages on the private business of the licensee by means of the licensed apparatus between the said stations.

* The terms of this license are no longer operative, and a new form of license is likely to be issued shortly.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:

1. In these presents (and in the schedule hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say) :—

The expression "the Postmaster-General" means the Postmaster-General for the time being.

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904.

The term "telegraph" has the same meaning as in the Telegraph Act 1869.

The expression "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy between ships of His Majesty's Navy and Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

The expression "the Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

Apparatus shall be deemed to be "syntonised" when the transmitting apparatus is so adjusted as to communicate with a receiver which has a corresponding adjustment and to produce as little effect as possible on a receiver not having a corresponding adjustment.

2. (1) The licensed apparatus shall not be used by the licensee or by any person either on behalf or by permission of the licensee for any purpose except for the transmission and receipt of such messages as aforesaid between and at the stations specified in the Schedule hereto.

(2) No money or other valuable consideration shall be received by the licensee or by any other person with the authority or by the permission of the licensee in respect of the transmission or receipt of any messages by means of the licensed apparatus or any part thereof.

3. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with naval signalling.

(2) Whenever the operators at any signal station of the licensee perceive through the medium of the instruments used by them that naval signalling is proceeding they shall refrain from using the licensed apparatus until all indication that naval signalling is proceeding shall have ceased.

(3) The licensee shall if so required in writing by the Admiralty cease to use the licensed apparatus for such period (not exceeding two hours in any one day) as may be specified by the Admiralty.

(4) If the Admiralty are of opinion that the working of the licensed apparatus at any station specified in the Schedule hereto is inconsistent with the free use of naval signalling the licensee shall when required in writing by the Postmaster-General close the said station.

(5) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of this license.

4. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Telegraph Acts 1863 to 19 by the Postmaster-General with the consent of the Treasury in relation to the conduct of wireless telegraph business.

5. (1) The licensee shall so work the licensed apparatus as not to interfere with the working of any wireless telegraph station established in the British Islands or the territorial waters abutting on the coasts of the British Islands (whether on shore or on any ship) by or for the purposes of the Postmaster-General or any department of His Majesty's Government or for commercial purposes and in particular with the transmission or receipt of any messages between or at wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(2) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Postmaster-General and with all rules prescribed by the Postmaster-General for observance by his licensees—

(*a*) With respect to all arrangements to be adopted for the purpose of securing syntonised apparatus or for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station;

(*b*) With respect to any alternation of messages which the Postmaster-General may think necessary; and

(*c*) Generally with respect to avoiding interference between one wireless telegraph station and another.

6. The licensed apparatus shall not without the consent in writing of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the Schedule hereto.

7. The licensee shall at all times indemnify the Postmaster-General against all actions, claims and demands which may be brought or made by any corporation company or person in respect of any injury arising from any act licensed or permitted by these presents.

8. The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

9. Subject to the provisions of this license the licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

10. The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the stations or other premises in the possession or occupation of the licensee either solely or jointly with any other person or persons for the purpose of inspecting and may inspect any apparatus fixed or being in such places respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such places respectively and the working and user

of such apparatus and telegraphic instruments respectively.

11. (1) All apparatus used or intended to be used by the licensee shall be so erected fixed placed and used as not either directly or by reason of the working or user thereof to interfere with the efficient or convenient maintenance working or user of any telegraphic line of the Postmaster-General which may from time to time exist or which it is probable that the Postmaster-General may have occasion to erect place fix or use or to expose any such line to risk of damage or to risk of interference with the efficient or convenient working or user thereof.

(2) In case any telegraphic line of the Postmaster-General shall be damaged or the efficient working or user thereof shall be wholly or partially interrupted or otherwise interfered with and the Engineer-in-Chief for the time being of the Post Office shall certify in writing under his hand that such damage interruption or interference has been caused directly or indirectly by any apparatus used or intended to be used by the licensee or by anything done by or on behalf of the licensee in relation thereto the licensee shall on demand pay to the Postmaster-General all costs that shall be reasonably incurred by him in repairing such damage and in removing or altering such telegraphic line so as to restore the same to efficient working order and in adding thereto or substituting therefor either temporarily or permanently any other telegraphic line if the said Engineer-in-Chief shall certify that such addition or substitution is reasonably required.

(3) For the purposes of this Article the expression "telegraphic line" has the same meaning as in the Telegraph Act 1878 and the expression "telegraphic line of the Postmaster-General" includes a telegraphic line belonging to or worked by the Postmaster-General or constructed or maintained by him for any Department of the Government or other body or person.

12. (1) The licensee shall pay to the Postmaster-General on the 1st day of December next for and in respect of the license hereby granted a royalty of £ per annum in respect of each station.

(2) In the event of the renewal of this license the said royalty shall be payable on the same day in each succeeding year.

13. Except with the consent in writing of the Postmaster-General the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licenses powers or authorities hereby granted or any of such licences powers or authorities.

14. If and whenever in the opinion of one of His Majesty's Principal Secretaries of State an emergency shall have arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus it shall be lawful for the said Secretary of State by warrant under his hand to direct and cause the licensed apparatus or any part hereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and in that event any person authorised by the said Secretary of State may enter upon the stations offices and works of the licensee or any of them and take possession thereof and use the same as aforesaid.

15. The Postmaster-General may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Postmaster-General under any condition or provision herein contained.

16. In any of the following cases (that is to say):—

(*a*) In case any sum of money which ought to be paid by the licensee to the Postmaster-General under or by virtue of these presents shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(*b*) In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions (other than a provision for the payment of money) or conditions herein contained;

then and in any such case the Postmaster-General may by writing under his seal revoke and determine these presents and the licenses powers and authorities hereinbefore granted and each and every of them and thereupon these presents and the said licenses powers and authorities and each and every of them shall absolutely cease determine and become void.

Provided always that no such revocation or determination as aforesaid shall prejudice or affect any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

17. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish extend maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Postmaster-General from time to time to enter into agreements for or to grant licenses relative to the working and user of telegraphs (whether of a like nature or those hereby licensed or otherwise) or the transmission of messages in any part of the United Kingdom by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit and (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under the Telegraph Acts or any of them.

18. Any notice request or consent (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of any one of the Secretaries or Assistant Secretaries for the time being of the Post Office, and may be served by sending the same in a registered letter addressed to the licensee at the usual or last known place of residence or business of the licensee, and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office London.

F In October, 1912, the Board of Trade, at the request of the Lords Commissioners of the Admiralty, issued a notice directing the attention of Masters and Owners of British Merchant Vessels to the necessity for arranging for periodical practices in Wireless Telegraphy communications between H.M. Ships of War and Ships of the British Mercantile Marine for the purpose of ensuring efficient and reliable communication when required.

The co-operation is invited of all British shipowners and masters whose ships are fitted with wireless telegraphy, in order to give effect to the following proposals :—

(1) At 8.30 a.m. and 2.30 p.m. daily any single man-of-war (destroyers and small craft excluded) or one man-of-war in a fleet in company, detailed by the Senior Naval Officer present, will adjust her wireless telegraphy transmitting and receiving apparatus to the commercial 600 metre wavelength and make the call "CCCC," followed by her own commercial call sign, indicating that she is prepared to carry out an exercise with any British merchant ship within range.

On a British merchant ship receiving this call she will answer and say whether or not she is prepared to proceed with the exercise. Should more than one merchant ship answer, the man-of-war will indicate which is to exercise and which is to wait.

The exercise will then proceed, but no messages are to be exchanged which are not authorised by the respective captains and masters of the ships practising. No message received during such exercises is to be forwarded beyond the ship actually receiving the message and no payment for any message can be made. The exercises are to be considered as strictly on Service and not for any commercial advantage.

(2) In all such exercises the man-of-war is to be considered the controlling ship.

(3) The exercises will cease at 9.15 a.m. and 3.15 p.m. respectively, or before, at the discretion of the captains concerned.

(4) These exercises are only to be carried out between vessels neither of which is within 150 miles range of any commercial shore station using the 600 metre wavelength, and are to cease at once should one of H.M. ships so direct.

Merchant Shipping (Convention) Act, 1914.

G An Act to make amendments of the law relating to Merchant Shipping as are necessary or expedient to give effect to an International Convention for the Safety of Life at Sea, signed in London on January the twentieth, nineteen hundred and fourteen, and for purposes incidental thereto.

(August 10th, 1914.)

PART III.

(*Which deals with Wireless Telegraphy.*)

15. (1) Subject to the provisions of this Act every British ship registered in the United Kingdom which carries 50 or more persons shall be provided with a wireless telegraphy installation, and shall maintain a wireless telegraphy service which shall be at least sufficient to comply with the rules made for the purpose under this Act, and shall be provided with certified operators and watchers at least in accordance with those rules. Provided that the obligations imposed by this section shall not come into operation until such date, not being less than six months after the making of those rules, as may be specified in the rules.

(2) In reckoning the number of persons carried on a ship for the purpose of this section, persons shall not be counted who are exceptionally and temporarily carried on a ship—

(*a*) As the result of *force majeure*; or

(*b*) as the result of the necessity of increasing the number of the crew to fill the places of members of the crew who are ill or disabled; or

(*c*) as the result of the obligation on the part of the master to carry shipwrecked persons, or persons in like circumstances; or,

(*d*) if so provided by rules of the Board of Trade, as cargo hands for a part of the voyage not being between one continent and another and not being, during the time the hands are carried, outside the limits of latitude thirty degrees north and thirty degrees south.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but if the offence is prosecuted summarily the fine shall not exceed one hundred pounds.

16. (1) The Board of Trade, in consultation with the Postmaster-General, shall make such rules with respect to wireless telegraphy installations and service on British ships which are registered in the United Kingdom and with respect to the carrying on those ships of operators and watchers for the purposes of wireless telegraphy, as appear to them necessary or expedient to carry into effect the pro-

The Schedule.

Name of Station.	Normal Range of Signalling.		Character of Apparatus.		Power.		If Alternator is used, No. of Cycles per Second.
	By Night.	By Day.	Description of Receiving Apparatus.	Wave-lengths (in Metres).	Source and Maximum Output.	Maximum to be taken by Transmitting Instruments.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

visions of the Convention mentioned in Part V of the Third Schedule to this Act.

(2) The Board of Trade may by rules made under this section exempt from the obligations of this Act as to wireless telegraphy—

(*a*) Ships while on voyages the course of which does not take the ship more than a hundred and fifty sea miles from the nearest coast, if the Board are satisfied that the route and the conditions of the voyage are such as to render compliance with those obligations unreasonable or unnecessary and,

(*b*) sailing ships on which owing to the peculiar or primitive nature of their build, it is impossible to provide a proper wireless telegraphy installation.

(3) The Board of Trade may by rules made under this section provide that any automatic calling apparatus which is certified by them to be efficient and to have been accepted by the parties to the Convention may be substituted, for the purposes of the provisions of this Act and any rules made thereunder relating to wireless telegraphy, for a certified operator or watcher.

17. The Board of Trade may postpone the operation of the provisions of this Act relating to wireless telegraphy as respects any particular ship for such period as the Board of Trade determine in each case, if it is shown by the owners of the ship that they have taken all reasonable steps to comply with the provisions of this Act as respects the ships, but that they have been unable to do so owing to difficulties in obtaining delivery of any wireless telegraphy apparatus or of obtaining the service of certificated operators or watchers.

The period of postponement under this section shall not exceed one year in the case of ships which are required in pursuance of the Convention to provide a first-class wireless telegraphy service, and two years in the case of ships which are so required to provide a third-class wireless telegraphy service, and in the case of ships which are so required to provide a second-class wireless telegraphy service shall not exceed one year as respects the provision of a wireless telegraphy installation and two years as respects the provision of a continuous watch.

H EXTRACTS FROM SUPPLEMENT TO *THE LONDON GAZETTE* OF TUESDAY, THE 29TH OF APRIL, 1919.

Wednesday, 30th April, 1919.

Air Ministry.

AIR NAVIGATION REGULATIONS, 1919.

ORDER OF THE SECRETARY OF STATE UNDER THE AIR NAVIGATION ACTS, 1911 TO 1919.

In pursuance of the powers conferred upon me by the Air Navigation Acts, 1911 to 1919, and all other powers enabling me in that behalf, I, the Right Honourable Winston Spencer Churchill, one of His Majesty's Principal Secretaries of State, by order make the following regulations :—

GENERAL CONDITIONS OF FLYING.

1. No aircraft shall fly within the limits of the British Islands and the territorial waters adjacent thereto unless the following conditions are complied with :—

. . . .

(6) No mails shall be carried without the consent in writing of the Postmaster-General and no wireless apparatus shall be installed or worked except under and in accordance with a license granted by the Postmaster-General, containing such conditions as may be approved by the Secretary of State :

. . . .

PRODUCTION OF LICENSES, CERTIFICATES AND LOG-BOOKS FOR INSPECTION.

6. (1) Any member of the personnel of an aircraft shall on demand produce his license for the inspection of any person authorised for the purpose by the Secretary of State.

(2) The owner and person in charge of any aircraft shall, on demand, produce for the inspection of any person authorised for the purpose by the Secretary of State, any certificates or licenses relating to the aircraft, and also, in the case of passenger or goods aircraft, any of the prescribed log-books.

EXCEPTIONS.

8. These regulations do not, except where otherwise expressly stated, apply—

(*a*) to military aircraft belonging to or employed in the service of His Majesty; or

(*b*) to any aircraft or to any persons if and to such extent as such aircraft or persons may be excepted from these regulations, or any of them, by direction of the Secretary of State on the recommendation of a Government Department.

PENALTIES.

10. (1) Where any aircraft flies in contravention of, or fails to comply with, these regulations or any provision thereof, the owner of the aircraft, and also the pilot or commander, shall be deemed to have contravened, or, as the case may be, failed to comply with these regulations :

Provided that it shall be a good defence to any proceedings for contravention or failure to comply with these regulations if the contravention or failure is proved to have been due to stress of weather or other unavoidable cause.

(2) If any person obstructs or impedes any person acting under the authority of the Secretary of State in the exercise of his powers and duties under these regulations, such first-mentioned person shall be deemed to have acted in contravention of these regulations.

(3) Any person contravening or failing to comply with these regulations or any provision thereof is liable to imprisonment for a term not exceeding six months or to a fine not exceeding two hundred pounds, or to both such imprisonment and fine.

(5) If any person in any aircraft is guilty of any act of espionage to which the provisions of section one of the Official Secrets Act, 1911, apply, he is liable to penal servitude for a term not exceeding seven years.

INTERPRETATION.

12. In these regulations, unless the context otherwise requires—

"Aircraft" includes airships and flying machines, all balloons, whether fixed or free, and kites ;

. . . .

"Military aircraft" includes naval, military, and air-force aircraft ;

. . . .

"Personnel" (in relation to any aircraft) includes any pilot, commander, navigator, and engineer, and any operative member of the crew ;

. . . .

The Interpretation Act, 1889, applies for the purpose of the interpretation of these regulations as it applies for the purpose of the interpretation of an Act of Parliament, and as if these regulations were an Act of Parliament.

SHORT TITLE.

14. These regulations may be cited as the Air Navigation Regulations, 1919.

WINSTON S. CHURCHILL,
One of His Majesty's Principal Secretaries of State.

Air Ministry, London,
30th April, 1919.

I CIRCULAR TO OWNERS AND MASTERS OF BRITISH MERCHANT SHIPS.

WIRELESS TELEGRAPHY IN MERCHANT SHIPS — RELAXATION OF RESTRICTIONS.

II. *Restrictions on Use of Wireless Telegraphy.*

1. All restrictions on the use of wireless telegraphy in ships are removed, except in the following waters :—

Baltic.
Black Sea and Sea of Marmora.

2. In the above waters wireless telegraphy communications are permitted as follows :—

(i) Between masters and owners on matters concerning the safety and working of the ship.

(ii) Between masters and naval authorities. Messages must be in code. A special code is supplied for this.

(iii) Official messages from accredited Ministers or Officials of H.M. Governments, or Officers of the Naval or Military Forces travelling in their official capacities as passengers on board, to Government departments, or Naval or Military authorities on shore. Should such officials require to send messages of any other description, they should be shown these instructions as constituting the Master's authority for refusing to have messages despatched.

(iv) *Private telegrams* are forbidden.

It should be borne in mind that stations belonging to foreign Governments are not yet all open to public correspondence.

3. In order to avoid delay in making distress signals whilst in the above waters the master is responsible that the wireless telegraphy office is informed whenever the vessel enters any of these zones. Whilst in these zones the operator is to be kept supplied, while on watch, with the position of the vessel. This is to be communicated to the operator in writing, and is to be corrected every half-hour.

4. Outside the waters named in par. 1 private messages are admitted.

Note.—Owners wishing to divert their ships by wireless should now send the necessary message *direct*, and *not* through the Director Mercantile Movements as heretofore.

This Circular cancels and replaces Section XXXII of "Admiralty Instructions for British Merchant Ships" (Addendum of 25th August, 1919, and Circular of 31st July, 1919).

Naval Staff,
Admiralty,
Nov. 22nd, 1919.

J MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ACT, 1919. CHAPTER 38.

AN ACT TO MAKE FURTHER PROVISION WITH RESPECT TO WIRELESS TELEGRAPHY ON SHIPS.

August 15th, 1919.

Be it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

1. (1) Every sea-going British ship registered in the United Kingdom being a passenger steamer or a ship of sixteen hundred tons gross tonnage or upwards shall be provided with a wireless telegraph installation, and shall maintain a wireless telegraph service which shall be at least sufficient to comply with the rules made for the purpose under this Act, and shall be provided with one or more certified operators and watchers, at least, in accordance with those rules :

Provided that the Board of Trade may exempt from the obligations imposed by this Act any ships or classes of ships if they are of opinion that, having regard to the nature of the voyages on which the ships are engaged, or other circumstances of the case, the provision of a wireless telegraph apparatus is unnecessary or unreasonable.

(2) The Board of Trade, in consultation with the Postmaster-General, shall make rules prescribing the nature of the wireless telegraph installation to be provided, of the services to be maintained, and the number, grade, and qualifications of operators and watchers to be carried :

Provided that no ship shall be required to carry more than one operator unless more than one operator would have been required under the provisions of the Merchant Shipping (Convention) Act, 1914.

(3) If this section is not complied with in the case of any ship, the master or owner of the ship shall be liable in respect of each offence to a fine not exceeding five hundred pounds, and any such offence may be prosecuted summarily, but if the offence is prosecuted summarily, the fine shall not exceed one hundred pounds.

(4) A surveyor of ships or a wireless telegraphy inspector may inspect any ship for the purpose of seeing that she is properly provided with a wireless telegraph installation and certified operators and watchers in conformity with this Act, and for the purpose of that inspection shall have all the powers of a Board of Trade inspector under the Merchant Shipping Acts, 1894 to 1916.

If the said surveyor or inspector finds that the ship is not so provided, he shall give to the master or owner notice in writing pointing out the deficiency, and also pointing out what in his opinion is requisite to remedy the same.

Every notice so given shall be communicated in the manner directed by the Board of Trade to the chief officer of customs of any port at which the ship may seek to obtain a clearance or transire, and the ship shall be detained until a certificate under the hand of any such surveyor or inspector is produced to the effect that the ship is properly provided with wireless telegraph installation and certified operators and watchers in conformity with this Act.

(5) The obligations imposed by this Act shall not come into operation while the obligations with respect to wireless telegraphy on ships imposed by the Defence of the Realm Regulations remain in force, but shall be in addition to, and not in substitution for, the obligations as to wireless telegraphy imposed by the Wireless Telegraphy Act, 1904, or any Order in

Council, or regulations made thereunder, or by the Merchant Shipping (Convention) Act, 1914.

2. The foregoing provisions of this Act shall, as from a date three months after the coming into operation of the obligations imposed by this Act on British ships registered in the United Kingdom, apply to ships other than British ships registered in the United Kingdom while they are within any port in the United Kingdom in like manner as they apply to British ships so registered.

3. (1) This Act may be cited as the Merchant Shipping (Wireless Telegraphy) Act, 1919, and the Merchant Shipping Acts, 1894 to 1916, and this Act may be cited together as the Merchant Shipping Acts, 1894 to 1919.

(2) This Act shall be construed as one with the Merchant Shipping Act, 1894, and "passenger steamer" shall mean a steamer which carries more than twelve passengers, and "wireless telegraphy inspector" means an officer appointed under section twenty of the Merchant Shipping (Convention) Act, 1914, for the purposes therein mentioned.

K THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) RULES, 1920, DATED JULY 10TH, 1920, MADE BY THE BOARD OF TRADE UNDER THE MERCHANT SHIPPING (WIRELESS TELEGRAPHY) ACT, 1919 (9 & 10 GEO. 5, C. 38).

The Board of Trade hereby make the following rules under the provisions of the Merchant Shipping (Wireless Telegraphy) Act, 1919.

Dated this tenth day of July, 1920.

H. A. PAYNE,
Secretary to the Board of Trade.

INTERPRETATION.

1. In these Rules—

The expression "coasting trade" means trade exclusively carried on between ports in the British Islands.

The number of hours occupied in a voyage from port to port means the normal number of hours occupied in a voyage between one port of call and the next.

CLASSIFICATION OF SHIPS.

2. For the purposes of these Rules ships shall be classified as follows:—

Class I—Ships carrying 200 persons or more which are not engaged in the coasting trade.

Class II—Ships not engaged in the coasting trade carrying 50 but less than 200 persons and ships engaged in the coasting trade carrying 50 persons or more.

Class III—Ships carrying less than 50 persons.

In reckoning the number of persons carried by a ship there shall be included the normal crew of the ship and the maximum number of passengers permitted to be carried by the passenger certificate of the ship.

NATURE OF INSTALLATION.

3. The installation shall comply with the requirements of the International Radiotelegraph Convention, 1912, as modified by any other international agreement (and in particular the International Convention of Safety of Life at Sea, 1914), or of any international agreement by which the said Convention of 1912 may be superseded.

4. The installation shall be of the spark or interrupted continuous wave type.

5. (1) The installation shall include a normal installation and an emergency installation, except that where the normal installation complies with the requirements of this rule as to emergency installations as well as those as to normal installations a normal installation alone shall suffice.

(2) A normal installation must be capable of transmitting clearly perceptible signals from ship to ship over a range of at least 100 nautical miles by day under normal condition and circumstances.

(3) An emergency installation must include an independent source of energy capable of being put into operation rapidly and of working for at least six continuous hours with a minimum range from ship to ship of 80 nautical miles for ships of Class I, and 50 nautical miles for ships of Classes II and III, and such independent source of energy must be capable of being worked for at least six continuous hours independently from the source of propelling power for the ship, the steam supply system and the main electricity supply system.

(4) For the purposes of this rule an installation shall be deemed to comply with the above requirements as to range if it is able to maintain communication on a 600 metre wave at a range of one-and-a-half times the number of nautical miles hereinbefore respectively prescribed over sea by day with a Post Office Standard Station when employing a receiver without amplification devices.

6. There shall be provided between the bridge and the wireless telegraph room means of communication by voice pipe, telephone or other means and an operator or watcher when on duty shall not leave the wireless telegraph room to deliver messages or to call his relief.

SHIPS NOT FITTED WITH APPROVED AUTOMATIC APPARATUS.

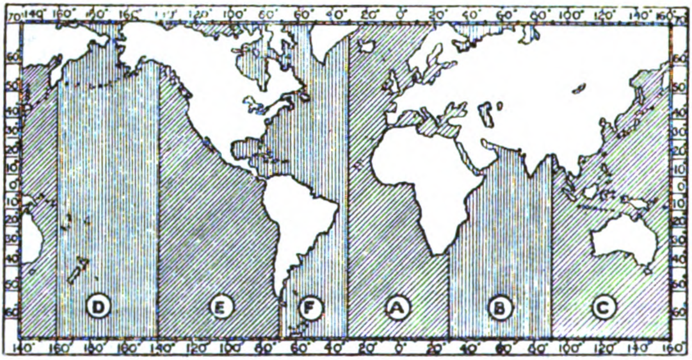
7. If not fitted with an approved automatic apparatus for registering the signal of distress—

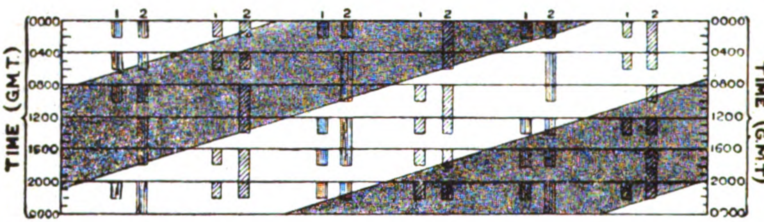
(i) A ship of Class I shall carry certificated operators in accordance with the following table, and while at sea a certificated operator shall be always on watch:—

NATURE OF VOYAGE.	NUMBER AND GRADE OF OPERATORS.
(*a*) Voyage exceeding 48 hours from port to port.	Three operators, of whom one shall hold a First Grade Certificate, and not more than one a Third Grade Certificate.
(*b*) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	Two operators of whom one shall hold a First or a Second Grade certificate.
(*c*) Voyage not exceeding 8 hours from port to port.	One operator who shall hold a First or a Second Grade certificate.

(ii) A ship of Class II shall carry certificated operators and certificated watchers in accordance with the following table, and while at sea a certificated operator shall always be on watch at the times specified in the Schedule to these Rules, and either a certificated operator or a certificated watcher shall always be on watch at other times.

NATURE OF VOYAGE.	NUMBER AND GRADE OF OPERATORS AND WATCHERS.
(*a*) Voyage exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade certificate, and two watchers





(b) Voyage exceeding 8 hours but not exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade certificate, and one watcher.
(c) Voyage not exceeding 8 hours from port to port.	One operator who shall hold a First or a Second Grade certificate.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall always be on watch at the times specified in the Schedule to these Rules.

Ships Fitted with Approved Automatic Apparatus.

8. In the event of an automatic apparatus for registering the signal of distress being approved by the Board of Trade and the Postmaster-General a ship of Class III shall be fitted with such apparatus unless the duration of the voyage on which it is employed does not exceed eight hours from port to port, but in such a case the operator shall be on watch during the whole time of the voyage.

9. If fitted with automatic apparatus for registering the signal of distress approved as aforesaid :—

(i) A ship of Class I shall carry certificated operators in accordance with the following table and while at sea a certificated operator shall always be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by a certificated operator, or by a watcher, or by means of the approved automatic apparatus :—

Nature of Voyage.	Number and Grade of Operators.
(a) Voyage exceeding 48 hours from port to port.	Two operators, one of whom shall hold a First Grade certificate.
(b) Voyage not exceeding 48 hours from port to port.	One operator who shall hold a First or a Second Grade certificate.

(ii) A ship of Class II shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

(iii) A ship of Class III shall carry one operator who shall hold a First or a Second Grade certificate, and while at sea the operator shall be on watch during the times specified in the Schedule to these Rules, and a watch shall be maintained at all other times either by an operator, or by a watcher, or by means of the approved automatic apparatus.

Provided that if a ship of Class III is fitted with an automatic apparatus for registering the signal of distress and with an automatic apparatus for registering the ship's own distinguishing signal, both of which have been approved by the Board of Trade and the Postmaster-General, the operator shall not, while the ship is more than 150 nautical miles from any coast station, be required to be on watch at the times specified in the Schedule to these Rules.

Qualifications of Operators.

10. (1) Operators shall be graded into three grades in accordance with Rules to be made by the Postmaster-General with the concurrence of the Board of Trade and watchers shall be certificated by the Postmaster-General.

(2) Until graded in accordance with such Rules as aforesaid :—

(i) An operator who holds the Postmaster-General's First Class certificate of Proficiency

Schedule.

TIMES OF WATCH FOR SHIPS REQUIRED TO CARRY ONE OR TWO OPERATORS.

Zones.	Western Limit.	Eastern Limit.	Times of Watch for One Operator, Greenwich Mean Time.	Times of Watch for Two Operators Greenwich Mean Time.
A. Eastern Atlantic, Mediterranean, North Sea, Baltic, Western Arctic Sea.	Meridian of 30° W., Coast of Greenland.	Meridian of 30° E. to the South of the Coast of Africa. Eastern limit of Mediterranean, Black Sea, and of the Baltic, 30° E. to the North of Coast of Norway.	from 8 h. to 10 h. 12 h. " 14 h. 16 h. " 18 h. 20 h. " 22 h.	from 0 h. to 6 h. 8 h. " 14 h. 16 h. " 18 h. 20 h. " 22 h.
B. Indian Ocean, Eastern Arctic Sea.	Eastern Limit of Zone A	Meridian of 90° East	from 0 h. to 2 h. 12 h. " 14 h. 16 h. " 18 h. 20 h. " 22 h.	from 0 h. to 2 h. 4 h. " 10 h. 12 h. " 14 h. 16 h. " 18 h. 20 h. " 24 h.
C. China Sea, Western Pacific Ocean.	Eastern Limit of Zone B.	Meridian of 160° E.	from 0 h. to 2 h. 4 h. " 6 h. 12 h. " 14 h. 20 h. " 22 h.	from 0 h. to 6 h. 8 h. " 10 h. 12 h. " 14 h. 16 h. " 22 h.
D. Central Pacific Ocean.	Eastern Limit of Zone C.	Meridian of 140° W	from 0 h. to 2 h. 4 h. " 6 h. 8 h. " 10 h. 20 h. " 22 h.	from 0 h. to 2 h. 4 h. " 6 h. 8 h. " 10 h. 12 h. " 18 h. 20 h. " 24 h.
E. Eastern Pacific Ocean.	Eastern Limit of Zone D.	Meridian of 70° W. South of the Coast of America, West Coast of America.	from 0 h. to 2 h. 4 h. " 6 h. 16 h. " 18 h. 20 h. " 22 h.	from 0 h. to 2 h. 4 h. " 6 h. 6 h. " 14 h. 16 h. " 22 h.
F. Western Atlantic Ocean and Gulf of Mexico.	Meridian of 70° W. South of the Coast of America, East Coast of America.	Meridian of 30° W., Coast of Greenland.	from 0 h. to 2 h. 12 h. " 14 h. 16 h. " 18 h. 20 h. " 22 h.	from 0 h. to 2 h. 4 h. " 10 h. 12 h. " 18 h. 20 h. " 22 h.

and who has had three years experience as an operator may be employed as if he held a First Grade certificate, but if an operator holding a First Grade certificate is available an operator holding a First Class certificate shall not be so employed on a ship of Class I which is required by these Rules to carry three operators.

(ii) An operator who holds the Postmaster-General's First or Second Class certificate of Proficiency and who has had one year's experience as an operator may be employed as if he held a Second Grade certificate.

(iii) An operator who holds the Postmaster-General's First or Second Class certificate of Proficiency and who has had less than one year's experience as an operator may be employed as if he held a Third Grade certificate.

11. The Postmaster-General may accept certificates granted to operators by the Government of any part of His Majesty's Dominions or of a foreign country in pursuance of the regulations annexed to any International Radio-telegraph Convention for the time being in force.

12. These Rules shall come into operation on the 1st day of September, 1920.

L EXPERIMENTS IN WIRELESS TELEGRAPHY.

AUTHORITY FOR SENDING AND RECEIVING.

SUMMARY OF CONDITIONS OF ISSUE.

N.B.—Under the Wireless Telegraphy Act, 1904, *the Postmaster-General's authority is necessary before any apparatus for wireless telegraphy is installed or worked.*

(*Note.—All sending stations must also be equipped for reception.*)

1. The applicant shall produce evidence of British nationality and two written references as to character. A certificate of birth should be furnished if possible; but this will not be insisted on if the referees testify of their own knowledge that the applicant is of British nationality. The referees should be persons of British birth and of standing, not related to the applicant.

In the case of a company, society or other body, application should be made by one of the principals on behalf of the company, etc. Any permit granted will be issued in his name and he will be personally responsible for the observance of its terms.

2. The installation shall be subject to the approval of the Postmaster-General and shall be open to inspection at all reasonable times by properly authorised officers of the Post Office.

3. Secrecy of correspondence shall be observed.

4. Applicants must satisfy the Postmaster-General that they have in view some definite object of scientific value or general public utility. If scientific research is intended they should be certified as competent investigators by a Government Department or some recognised scientific body.

5. Each sending station must be under the charge of a person who has satisfied the Postmaster-General, by examination or otherwise, that he has attained :—

(*a*) a sufficient knowledge of the adjustment and operation of the apparatus which he wishes to work.

(*b*) an operating speed of at least 12 words (Morse) a minute, sending and receiving.

A fee of 5s. will be charged for the examination referred to above, when necessary.

The person in charge of a sending station must also make himself acquainted with the regulations of the International Convention in so far as they relate to the prevention of interference and impose certain duties on all wireless operators. This information is contained in Section V of the Postmaster-General's Hand-book for Wireless Operators, which may be obtained through any bookseller or direct from the Stationery Office, price 9d., postage 2d.

A licensee not possessing the necessary operating qualifications may be allowed, exceptionally, to employ a qualified operator to work the sending apparatus.

6. Small fees are payable in order to cover the Post Office expenses in connection with the grant of a permit and subsequent inspection, etc., of the station. For each station authorised to use power up to 10 watts the charges, which will cover the use of receiving as well as sending apparatus, will comprise an initial licensing fee of 10s. plus an annual fee of £1, payable in advance (*i.e.*, 30s. for the first year and £1 for each succeeding year). Higher fees will be charged for more powerful stations.

7. Transmission will be sanctioned only to specified and duly authorised stations, not exceeding five in number. The written consent of the owner of each station to receive signals from the applicant's transmitting station should be furnished.

8. Aerials.

The maximum height and dimensions allowed are as follows :—

Extreme height of aerial above ground	100 feet.
Total length of wire, including leading-in wires	100 feet for single-wire aerial; 140 feet of wire where two or more wires are used (*e.g.*, total length of 70 feet of double wire).

9. Portable Stations.

General conditions same as for fixed stations.

Power of portable sending stations will usually be limited to 10 watts.

Use will ordinarily be authorised only within 10 miles of a fixed point.

EXPERIMENTS IN WIRELESS TELEGRAPHY.

M Authority for the Use of Receiving Apparatus.

Conditions of Issue, etc.

N.B.—Under the Wireless Telegraphy Act, 1904, the Postmaster-General's authority is necessary before any apparatus for wireless telegraphy is installed or worked.

Formal licenses to conduct experiments in wireless telegraphy cannot at present be granted; but, pending the settlement of certain outstanding questions, the Postmaster-General is prepared to authorise the use of wireless apparatus for the reception of signals on the following conditions :—

1. The applicant shall produce evidence of his British nationality and two written references as to character. (A certificate of birth should be furnished if possible; but this will not be insisted on if the two referees testify of their own knowledge that the applicant is of British nationality. The referees should be persons of standing, who are British subjects and not related to the applicant.)

Applications on behalf of a company, society or other body should be made by one of the principals of the company, etc. Any permit granted would be issued in his name and he would be personally responsible for the observance of its terms.

Authority to use wireless apparatus cannot be issued to a minor (*i.e.*, a person under 21 years of age). Application should accordingly be made on his behalf by his parent or guardian. In such cases the evidence and references specified in condition (1) should be furnished BOTH AS REGARDS THE MINOR AND HIS PARENT OR GUARDIAN. There would be no objection to a minor working the authorised apparatus as the agent of his parent or guardian.

2. There shall be no divulgence to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or any use whatever made of any message received by means of the apparatus.

3. The installation shall be subject to the approval of the Postmaster-General and shall be open to inspection at all reasonable times by properly authorised officers at the Post Office.

4. The aerial shall not exceed the undermentioned maximum height and dimensions :—

Extreme height of aerial above ground	100 feet.
Total length of wire including leading-in wires	100 feet for single wire aerial; 140 feet of wire where two or more wires are used (*e.g.*, total length of 70 feet of double wire).

5. Thermionic valves shall not be used without the special authority of the Postmaster-General. If such authority is desired, a diagram of the circuits should be furnished on the attached form.

6. A fee of 10s. per annum shall be paid in respect of each experimental receiving license to cover the expenses of the issue of the license and the inspection of the station.

The applicant for authority to use wireless receiving apparatus should complete the annexed form of application and return it to The Secretary General Post Office, London, E.C.1, together with the required evidence of British nationality, references and first year's fee of 10s.

The production of a permit from the Post Office for the use of wireless receiving apparatus

will be sufficient authority for the purchase by the person or firm to whom the permit has been granted of such apparatus as comes within the terms of the permit. The sales in these cases need not be reported to the Post Office by the vendors. If necessary, this form as well as the permit for the use of the apparatus, should be produced for the vendor's inspection.

FORM OF APPLICATION FOR AUTHORITY TO INSTAL AND USE WIRELESS TELEGRAPHY APPARATUS (RECEIVING ONLY).

1. (*a*) Name of applicant (with Christian names in full)

Address

Age , Occupation

(*b*) If the applicant is under 21 years of age the following questions should be answered by the person in whose name the permit is to be issued.

Name (with Christian names in full)

Address

Occupation

Relationship, if any, to applicant

2. Address at which apparatus will be installed

3. Description of apparatus

If authority is desired to use thermionic valves, a diagram should be furnished below of the circuits in which they would be used.

4. Sketch showing the form, height and dimensions of aerial (including leading-in wires).

I hereby accept the conditions (which I have withdrawn) attached to this application and I enclose evidence of nationality and two written references in respect of myself (*and) together with a remittance for 10s.

Signature (of the person in whose name permit is to be used)

Date

N EXTRACT FROM CONVENTION RELATING TO INTERNATIONAL AIR NAVIGATION (1919):—

ART. 14.—No wireless apparatus shall be carried without a special license issued by the State whose nationality the aircraft possesses. Such apparatus shall not be used except by members of the crew provided with a special license for the purpose.

Every aircraft used in public transport and capable of carrying ten or more persons shall be equipped with sending and receiving wireless apparatus when the methods of employing such apparatus shall have been determined by the International Commission for Air Navigation.

This Commission may later extend the obligation of carrying wireless apparatus to all other classes of aircraft in the conditions and according to the methods which it may determine.

O LICENSE TO ESTABLISH WIRELESS TELEGRAPH AIRCRAFT STATIONS.

To all to whom these presents shall concern.
I, the Right Honourable
His Majesty's Postmaster-General send greeting:

Whereas by reason of the provisions of the Telegraph Acts 1863 to 1920 it is unlawful to establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place in the United Kingdom or in any British aircraft except under and in accordance with a license granted in that behalf by the Postmaster-General:

And whereas (hereinafter called "the licensee") has applied to the Postmaster-General for the grant of a license to establish instal and work apparatus for wireless telegraphy as defined in Section 1 (7) of the Wireless Telegraphy Act 1904 at the aircraft station or stations mentioned in the First Schedule hereto:

Now I the above-named His Majesty's Postmaster-General in exercise of all powers and authorities enabling me in this behalf do hereby grant to the licensee during the term or period commencing on the day of the date hereof and terminating on the thirty-first day of December one thousand nine hundred and unless and until these presents and the license or permission hereby given shall be determined as hereinafter provided license and permission—

I. To establish instal and work for the purposes hereinafter mentioned at the aircraft station or stations specified in the First Schedule hereto apparatus for wireless telegraphy of the kind specified in the Schedules hereto (which apparatus is hereinafter referred to as "the licensed apparatus");

II. To send and receive messages by means of the licensed apparatus for the purposes and subject in all respects to the conditions and restrictions contained in the Second Schedule hereto.

And I do hereby declare that the said license and permission is granted on and subject to the following conditions and provisions:—

1. In these presents (and in the Schedules hereto) the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something either in the subject or context repugnant to such construction (that is to say):—

The expression "the Postmaster-General" means the Postmaster-General for the time being.

The expression "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act 1904.

The term "telegraph" has the same meaning as in the Telegraph Act 1869.

The expression "Naval signalling" means signalling by means by any system of wireless telegraphy between two or more ships or aircraft of His Majesty's Navy between ships or aircraft of His Majesty's Navy and Naval stations or between a ship or aircraft of His Majesty's Navy or a Naval station and any other wireless telegraph station.

The expression "Government aircraft signalling" means signalling by means of any system of wireless telegraphy between two or more Government aircraft between any Government aircraft and any wireless station or between any Government aerodrome and any other wireless station.

The expressions "the International Telegraph Convention" and the "International Telegraph Regulations" mean respectively the International Convention of St. Petersburg dated the 10th to 22nd July 1875 and the Service Regulations made thereunder and include respectively any modifications of the Convention or Regulations made from time to time.

The expression "the Radiotelegraph Convention 1912" means the Convention signed at London on the 5th day of July 1912 and

* Delete if applicant not under 21 years of age.

the Service Regulations made thereunder and includes any modification of the Convention or Regulations made from time to time.

The term "aircraft" includes all balloons. whether fixed or free, airships and flying machines.

The term "ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. The licensed apparatus shall not be used by the licensee or by any other person either on behalf or by permission of the licensee for the despatch or receipt of messages except messages authorised by this license.

3.—(1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval signalling or Government aircraft signalling.

(2) Whenever the operators at any signal station of the licensees perceive through the medium of the instruments used by them that Naval signalling or Government aircraft signalling is proceeding they shall refrain from using the licensed apparatus until all indication that Naval signalling or Government aircraft signalling is proceeding shall have ceased.

(3) These provisions for the protection of Naval signalling or Government aircraft signalling shall be construed to be without prejudice to the generality of any other provisions of this licence.

4. For the purpose of this license the licensee shall observe the International Telegraph Convention and the International Telegraph Regulations so far as the said Convention and Regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

5. The licensee shall observe the provisions of any Regulations from time to time made under the provisions of the Telegraph Acts 1863 to 1920 by the Postmaster-General with the consent of the Treasury in relation to the conduct of wireless telegraph business so far as the same are applicable to the licensee.

6. The licensee shall observe the provisions of the Radiotelegraph Convention 1912 so far as they are not inconsistent with the other provisions of this license, the expressions "ship" and "ship station" in the Convention being read as if "aircraft" and "aircraft station" respectively were substituted therefor.

7. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Postmaster-General from time to time for the purpose of preventing interference with the working of any other wireless telegraph station and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

8. The licensee shall comply in all respects with all such directions and regulations as may from time to time be given or made by the Secretary of State for Air.

9. The licensed apparatus shall not without the consent of the Postmaster-General be altered or modified in respect of any of the particulars mentioned in the Schedules hereto.

10. The licensee shall at all times indemnify the Postmaster-General against all actions claims and demands which may be brought or made by any Corporation Company or person in respect of any injury arising from any act licensed or permitted by these presents.

11. The licensee shall so far as possible receive from aircraft ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and send them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in the power of the licensee.

12.—(1) The licensed apparatus at each of the aircraft stations mentioned in the First Schedule hereto shall be worked only by operators holding Air Operators' certificates issued by the Postmaster-General and such operators shall only work the apparatus in accordance with the tenor of the certificate which they hold and subject in all respects to the conditions of this license.

(2) Air Operators' Certificates will be of two classes. A First Class Certificate authorising the holder to work wireless apparatus on aircraft for the sending or receiving of messages in general and a Second Class Certificate authorising the holder to work wireless apparatus on aircraft for the purpose of sending and receiving spoken messages only. Such certificates will be granted to approved natural-born British subjects of such technical proficiency and will be subject to such conditions as the Postmaster-General shall from time to time prescribe and they may be endorsed or withdrawn at the discretion of the Postmaster-General in accordance with the conditions to which the certificates respectively are subject.

13. The licensee shall not divulge to any person (other than properly authorised officials of His Majesty's Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus. The licensee shall exhibit at each of the stations specified in the Schedule hereto a copy of Section 11 of the Post Office (Protection) Act 1884 and any contravention of that section by any person in the employment of the licensee shall be deemed to be a breach of the provisions of this license.

14. The Postmaster-General and any agent authorised in that behalf in writing by him may at all reasonable times enter upon all or any of the aircraft stations hereby licensed for the purpose of inspecting and may inspect any apparatus fixed or being in such stations respectively for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations respectively and the working and user of such apparatus and telegraphic instruments respectively.

15. The licensee shall carry on every aircraft on which an aircraft station is established under this license a print or copy of the license certified under the hand of an appropriate officer of the Postmaster-General to be a true copy and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the aircraft calls.

16. The licensee shall forthwith pay to the Postmaster-General for and in respect of the license hereby granted a royalty of five shillings per annum in respect of each aircraft station at which the licensed apparatus is installed.

17. Except with the consent in writing of the Postmaster-General the licensee shall not assign underlet or otherwise dispose of or admit any other person or body to participate in the benefit of the licenses powers or authorities hereby granted or any of such licenses powers or authorities.

18.—(1) Inasmuch as an emergency has arisen in which it is expedient for the public service

that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus and if and whenever any such emergency shall arise it shall be lawful for any Naval Military Air or Police Officer or any other person authorised by the Secretary of State for Air to take possession of the licensed apparatus or any part thereof in the name and on behalf of His Majesty and to use the same for His Majesty's service and any such officer or person so authorised may enter upon any aircraft on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid and subject to such use may use the same or allow it to be used for such ordinary services as may in his discretion seem fit to him or may prohibit and take steps to prevent use of the same and issue directions which shall be obeyed by the licensee to prevent such use.

(2) Any such officer or person so authorised as aforesaid may instead of taking possession of the licensed apparatus as aforesaid direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct and such persons may enter upon any aircraft on which any apparatus is installed accordingly or the said officer or person so authorised as aforesaid may direct the licensee to submit to him or any person authorised by him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said officer or person so authorised as aforesaid may prescribe and the licensee shall obey and conform to all such directions.

(3) The licensee shall be entitled to reasonable compensation for any damage to the licensed apparatus arising in consequence of the exercise of the powers conferred by this clause.

19. The Postmaster-General may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby granted at the end of one calendar month from the date of such notice and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly but without prejudice to any remedy of the Postmaster-General under any condition or provision herein contained.

20. In case of any breach non-observance or non-performance by or on the part of the licensee of any of the provisions or conditions herein contained then and in any such case the Postmaster-General may by notice in writing under his seal revoke and determine these presents and the licenses powers and authorities hereinbefore granted and each and every of them as to all or any of the aircraft stations hereby licensed and thereupon these presents and the said licenses powers and authorities and each and every of them shall absolutely cease determine and become void as to all or any of the said aircraft stations (as the case may be) but without prejudice to any right of action or remedy which shall have accrued or shall thereafter accrue to the Postmaster-General under any condition or provision herein contained.

21. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General from time to time to establish extend, maintain and work any system or systems of telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit neither shall anything herein contained prejudice or affect the right of the Postmaster-General from time to time to enter into agreements for or to grant licenses relative to the working and user of telegraphs (whether of a like nature to those hereby licensed or otherwise) or the transmission of messages in any part of the United Kingdom by means of wireless telegraphy or by any other means with or to any person or persons whomsoever upon such terms as he shall in his discretion think fit. And (save as in this license expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Postmaster-General by or under : Telegraph Acts or any of them.

FIRST SCHEDULE.

1. Name or Number of Aircraft on which Station established.	2. Call Signal.	3. Type of Aircraft.	4. Make of Aircraft.	5. Registered Marking.	6. Character of Apparatus. *a.* Type.	*b.* Power in Watts.	*c.* Waves.	*d.* Number of cycles per second.

22. Any notice request or consent (whether expressed to be in writing or not) to be given by the Postmaster-General under these presents may be under the hand of any officer of the Post Office duly authorised by him and may be served by sending the same in a registered letter addressed to the licensee at the usual or last-known place of residence or business of the licensee and any notice to be given by the licensee under these presents may be served by sending the same in a registered letter addressed to the Secretary of the Post Office at the General Post Office London.

As witness my hand and seal this
day of one thousand nine
hundred and

SECOND SCHEDULE.

Provisions as regards Qualities of Apparatus and Conditions of Working.

1. The licensed apparatus shall be in keeping with scientific and technical requirements as determined by the Postmaster-General from time to time and shall comprise apparatus for sending and receiving messages. The licensed apparatus at each aircraft station shall be properly adjusted in all respects before the aircraft commences its flight.

2. The sending apparatus used at each aircraft station shall be of such a character that the waves emitted are undamped; and the receiving apparatus at each aircraft station shall be of such a character as to afford the greatest possible protection from disturbance during the reception of messages.

3. The sending apparatus installed at each aircraft station shall be so constructed as to be capable of using waves of 600 metres interrupted-continuous wave (hereinafter referred to as "the Aircraft Ship Wave") and 900 metres continuous wave (hereinafter referred to as "the Aircraft Normal Wave"). It may also be constructed so as to be capable of using the following waves, viz.—220, 300, 450 and 800 metres interrupted-continuous waves and 200 to 500 metres, 650 to 950 metres and 2,000 to 3,000 metres continuous waves: Provided always that, if the apparatus is so constructed as to be capable of using waves of 2,000 to 3,000 metres, it must also be capable of using 2,400 metres continuous wave: Provided further that the wavelengths before referred to shall not be used without the written permission of the Postmaster-General.

The use of the Aircraft Ship Wave shall be confined to the system known as interrupted undamped wave or tonic train Interrupted Continuous Wave and the Aircraft Normal Wave shall be used only for continuous undamped waves or for the purpose of sending and receiving spoken messages.

4. The wavelengths referred to in this Schedule shall be measured by the standard of measurement for the time being in use by the Postmaster-General.

5. The sending apparatus installed at each aircraft station may be so constructed as to be capable of varying the wave emitted by an amount equal to but not exceeding 3,000 cycles per second above and below the frequency of the normal wave in use: Provided always that such variation from the normal wave shall be used only—

(*a*) When first calling up;

(*b*) When communication has not been established when first calling up; or

(*c*) In case of distress.

6. The receiving apparatus installed at each aircraft station may be constructed so as to receive waves of any length, but it shall be constructed so as to be capable of receiving messages on the Aircraft Ship Wave and the Aircraft Normal Wave: Provided always that if the sending apparatus shall be capable of using the wavelengths mentioned in paragraph 3 of this Schedule the receiving apparatus shall be so constructed as to be capable of receiving messages on these wavelengths.

7. The input of power to the licensed apparatus measured at the terminals of the power generator or battery shall not exceed 100 watts: Provided that when vacuum valves having heated filaments constitute a part of either the sending or receiving apparatus or both the power employed for heating the said filaments shall be excluded in computing the maximum input.

8. The licensed apparatus shall not be used except during actual flight or in case of forced landing.

9. The licensed apparatus may be used for receiving messages on any subject, but shall be used only for sending messages on the following subjects:—

(*a*) Distress signals;

(*b*) Meteorological information;

(*c*) Forced landings and landing instructions;

(*d*) Positions;

(*e*) Supply of fuel and spare parts;

(*f*) Origin, destination, or course of flight.

10. Except with the written permission of the Postmaster-General, the Aircraft Normal Wave and no other wave shall be used for the sending and receipt of messages to and from—

(*a*) Other aircraft stations;

(*b*) Ground stations specified by the Secretary of State for Air.

11. Except with the written permission of the Postmaster-General, the Aircraft Ship Wave and no other wave shall be used for the sending and receipt—

(*a*) Of messages to and from ships of His Majesty's fleet and merchant ships;

(*b*) Of such messages as are rendered necessary by reason of exceptional emergency and not coming within the scope of the above-mentioned provisions for the use of the Aircraft Normal Wave.

12. The procedure employed for the sending and receipt of messages to and from each aircraft station and other aircraft stations shall conform to instructions laid down by the Secretary of State for Air.

Signed sealed and delivered by
in the presence of
On behalf of the Postmaster-General

P WIRELESS DIRECTION FINDING STATIONS.

Use by the Mercantile Mariner.

Admiralty Notice to Mariners, No. 524 of 25th March, 1920.

The following is promulgated for information:—

The Admiralty have recently received evidence from various sources that the existence of Wireless Direction Finding Stations in the United Kingdom, France, Canada, the United States and Germany, and the regulations under which these stations are operated, are not as generally known throughout the Mercantile Marine as is desirable in view of the immense

value of the system of wireless direction finding as an aid to navigation, especially in thick and foggy weather.

2. On the other hand, returns rendered by the stations in the United Kingdom show that where the system is known to masters it is beginning to be more extensively used, not only when atmospheric conditions render it impossible to obtain the ship's position by any other means, but as a check on positions obtained by the ordinary method of navigation.

3. Information on this subject was first published in Admiralty Notice to Mariners No. 1,019 of May 23rd, 1919. This Notice has since been revised, and the latest information on the subject is contained in Admiralty Notice to Mariners No. 363 of the year 1920 (reproduced in Board of Trade Notice to Mariners). This Notice should be studied by masters who desire to make use of this system; the procedure to be adopted, which varies to some extent for the different stations and as to the wavelength to be used, is set out therein in detail. It is equally necessary that W/T operators should study the procedure.

4. Briefly put, a ship requiring a bearing calls up the D.F. station or stations from which it is desired to receive a bearing, singly or together, according to the procedure laid down. The station or stations reply with the bearing (true) of the ship from that station.

5. The following stations are established in the United Kingdom: Peterhead, Berwick, Flamborough, Lizard, Amlwch, Rhyl, Carnsore, Larne, Seaview (Malin Head).

6. These stations are operated by the Royal Navy, but are available for the use of the Mercantile Marine.

7. A charge of five shillings (5s.) will be made as from April 1st, 1920, for each bearing asked for and given. Thus, if bearings from two stations or two separate bearings from one station were asked for, the charge would be ten shillings (10s.).

8. Charges will be collected by the Accountant-General of the Navy from the Administration controlling and operating the ships concerned, in accordance with the present system of collecting charges for W/T commercial messages.

9. The accuracy with which bearings can be taken depends on certain conditions outlined in the Notice to Mariners referred to, but, although the bearings given by a station within the section over which it is designed to work can generally be considered accurate to within two degrees, it must be distinctly understood that the Admiralty provide this service on the express condition that they incur no liability for any consequences resulting directly or indirectly from any inaccuracy in the bearings given from any failure in the service, or from any other cause whatever.

(*Notice No. 524 of 1920, dated March 25th.*)

Authority.—The Lords Commissioners of the Admiralty. (*H.* 2049/20.)

Q WIRELESS DIRECTION FINDING STATIONS.

ADMIRALTY NOTICE TO MARINERS, No. 838 OF 22ND MAY, 1920.

1. Wireless direction finding (D.F.) stations are stations set up ashore equipped with receiving apparatus which enables them to ascertain the direction from which wireless signals transmitted by another station emanate.

2. The accuracy with which bearings can be taken depends on the conditions outlined below; but, although in general the bearings taken by a station within the sector over which it is designed to work can generally be considered accurate to within two degrees, the administrations controlling these stations cannot accept any responsibility for the consequences of a bearing being inaccurate.

3. It is, however, pointed out that if at least three D.F. stations can be employed and if they are so situated as to give intersecting bearings, considerable reliance can be placed upon the result of 3 simultaneous bearings thus obtained, provided that the "triangle of error" (sometimes called the "cocked hat") formed by the intersection of the bearings is small.

4. In order to obtain the greatest possible degree of accuracy, it is important that the ship should not transmit with too much power. Signals should, however, be fairly strong and clear; great care must be taken to keep the note and strength steady, and to pay strict attention to spacing.

5. It must be borne in mind that it is impossible for the majority of existing D.F. stations to distinguish between a bearing and its reciprocal (*i.e.*, there is always a possible error of 180°), and that bearings are often unreliable at night and in very bad weather, also when the direction runs roughly parallel with the coast line.

6. The methods of asking for and giving bearings and the waves to be used will shortly be standardised by International agreement; and the particulars of the D.F. stations will eventually appear in the International List of Radiotelegraph Stations. Meanwhile, each country is publishing regulations governing the use of its own D.F. stations as set out below.

7. It should be noted that there are two principal systems of D.F. stations at present in use, viz.:—

(*a*) Where each D.F. station is fitted with transmitting and receiving gear and works independently of others.

(*b*) Where several D.F. stations (all of them usually near a harbour entrance or difficult passage) are linked together by special land telegraph lines, being thus controlled by one station which alone is fitted with transmitting apparatus. The controlling station in such cases is not necessarily a D.F. station but may be an ordinary coast station.

REGULATIONS FOR CANADIAN AND NEWFOUNDLAND D.F. STATIONS.

8. The following independent D.F. stations are established:—

Station.	*Call Signal.*	*Range (miles).*	*Lat. N.* ° ′ ″	*Long. W.* ° ′ ″
Chebucto Head	VAV	250	44 30 01	63 31 20
Canso ..	VAX	100	45 19 24	60 58 25
Cape Race	VAZ	250	46 39 10	53 05 05

9. These stations keep watch and take bearings on the 600-metre wave.*

* After 1st August, 1920, the 800 metre wave will be used exclusively both for transmission and reception. See notice "L" under "Canada."

10. A ship requiring a bearing should call the D.F. station required and transmit a *government* message requesting the bearing.

Example.—A ship, s.s. *Nonsuch*, call sign XYZ, calls up Chebucto Head in the ordinary way and, on receiving "K" (go on), makes the message as follows :—

"Call" S Radio Nonsuch 1, 5, 10 (day of month) 10.50 M (time) = Officer in charge Chebucto Head = Request bearing = Master + XYZ.

11. The D.F. station will then acknowledge receipt of the message and, if not ready to take the bearing at once, will direct the ship to wait.

12. When ready to take the bearing, the D.F. station will make "K" (go on), whereupon the ship will make the figure "2" 30 times, commencing with the "Call" and ending with the "Cross" and her own call signal.

13. If the D.F. station is not satisfied with the bearing, it will make the "repeat" sign (?) and the ship will again make the figure "2" as above, but only 20 times.

14. In default of such request for a repetition, the D.F. station does not transmit until it is ready to give the bearing. To do so, the station calls the ship and sends (as a government message) the TRUE bearing of the ship *from* the station in degrees from 0° to 359°, the angles being measured from true north (0°) clockwise through true east (90°), true south (180°), and true west (270°).

Regulations for D.F. Stations in the United States.

15. The following U.S. Naval D.F. stations are now in operation for the purpose of furnishing bearings to vessels in the Western Atlantic. Stations marked * are in continuous operation in foggy weather only.

The stations given in the former Notice, which are not included in the following list, are to be expunged from the charts.

16. Where two or more of the foregoing D.F. stations have the same call signal it indicates that they are connected by telegraph to and under the control of a central control station the call signal being the call of the central control station. When a request for bearings is made the central control station invariably answers with a bearing from each of the D.F. stations under its control.

17. The following signals have been authorised and will be used until further notice :—

Signal.	*Meaning.*
QTE ? ..	What is my true bearing ?
QTE ..	Your true bearing is —— degrees from —— D.F. station.

18. To obtain bearings, the D.F. station should be called on 800 metres in the usual manner, and the call followed by the signal "QTE ?" meaning "What is my true bearing ?" When told by the D.F. station to "K" (go ahead), the ship's operator should follow the procedure outlined below :—

(*a*) Transmit the ship's call signal for 30 seconds.

(*b*) Make dashes, each dash 5 seconds long, for one minute, with the ship's call signal after each dash.

(*c*) Terminate with the signal "K" (go ahead).

19. If satisfactory bearings are obtained, the operator at the D.F. station will call the vessel in the usual manner and reply "QTE" followed by the true bearing in degrees (0 to 359) spelled out in words, and the name of the D.F station from which the bearing was obtained ; otherwise a repetition of the test will be requested.

20. The ship's operator should acknowledge receipt of the bearings by answering the D.F. station in the usual manner and repeat, in numerals, the bearings received. This procedure enables all stations concerned to check the bearings.

21. All United States Naval D.F. stations keep watch and transmit on 800 metres for merchant vessels, and this wavelength should be used for calling and answering and carrying on all communication with these stations.

22. In order that the operation of shore D.F. stations may be checked up, a brief report should be forwarded to the Director Naval Communications, Navy Department, Washington, D.C., containing :—

(*a*) Name of ship.
(*b*) Name of D.F. station.
(*c*) Date and G.M.T. at which wireless bearing was given.

Station.	*Call Signal.*	*Latitude. N.*			*Longitude. W.*		
		°	′	″	°	′	″
Bar Harbour, Me.	NBD	44	18	36	68	11	27
Gloucester, Mass.	NAD	42	35	19	70	41	08
Deer Island, Mass.*	NAD	42	21	15	70	57	30
Surfside, Nantucket, Mass.	NBS	41	14	42	70	05	56
Montauk, Long Island, N.Y.	NAH	41	03	09	71	57	27
Fire Island, N.Y.	NAH	40	38	07	73	12	32
Sandy Hook, N.J.	NAH	40	28	12	74	01	06
Mantoloking, N.J.	NAH	40	01	30	74	03	10
Cape May, N.J.	NSD	38	56	41	74	53	10
Bethany Beach, Del.	NSD	38	32	45	75	03	21
Hog Island, Va.	NCZ	37	22	36	75	42	37
Cape Henry, Va.	NCZ	36	55	16	75	59	51
Cape Hatteras, N.C.	NDW	35	14	22	75	31	42
Cape Lookout, N.C.	NAN	34	36	13	76	32	15
North Island, N.C.	NZW	33	13	21	79	11	06
Morris Island, S.C.*	NAO	32	41	36	79	53	17

(*d*) Bearing given by D.F. station.

(*e*) Estimated position of ship at above time and date by methods other than wireless.

(*f*) The probable degree of accuracy of the estimated position.

(*g*) Weather conditions at above time.

(*h*) Remarks, if any.

(*i*) Signature of master or responsible navigating officer.

REGULATIONS FOR D.F. STATIONS IN THE UNITED KINGDOM.

23. The following D.F. stations are established:—

Station.	*Call Signal.*	*Latitude. N.* °	′	″	*Longitude. W.* °	′	″
Peterhead ‡	BVL	57	33	30	1	49	05
Berwick	BVG	55	41	48	1	53	40
Flamborough	BVN	54	07	05	0	04	58
Amlwch * ‡	BXV	53	24	28	4	18	20
Rhyl *	BZW	53	18	20	3	28	50
Lizard	BVY	49	59	07	5	12	18
Carnsore	BVZ	52	11	50	6	21	00
Larne	BXJ	54	51	15	5	48	15
Seaview †	BXK	55	22	00	7	19	25

* Rhyl is not fitted with transmitting apparatus and is controlled by Amlwch.

† Seaview is not fitted with transmitting apparatus and is controlled by Malin Head (GMH), which keeps watch on 600 metres.

‡ These stations are now closed.

24. All the above D.F. stations keep watch *and take bearings* on the 450 metres wave (*see* note). Except as shown in the notes they all work as independent stations and can transmit, as well as receive, on 450 metres.

Note.—Ships with Marconi apparatus can adjust their transmitting gear very nearly to this wave (using reduced power) by cutting out half the primary transmitting condenser and adjusting the A.T.I. till the earth lamp shows maximum current in the aerial. The primary slider should be "all in."

25. The actual procedure to be adopted by ships requiring bearings will depend upon what stations are concerned. It should be observed that if the stations to be called do not all keep watch on the same wave (*e.g.*, Malin Head and Larne), bearings should be asked for separately. If on the other hand the stations to be called all keep watch on the same wave (*e.g.*, Lizard and Carnsore), they should be called up together and the bearings taken in one operation. If, however, two or more stations are linked by special land lines (*e.g.*, Amlwch and Rhyl), only one of them should be called up. In such cases, however, the ship must specify in the preliminary signal the D.F. stations which are required to supply bearings.

26. The following abbreviations are to be used:—

Signal.		*Meaning.*
QTE ?	..	"What is my true bearing from you (or from ——) ?"
QTE	..	"Your true bearing from me (or from ——) was —— degrees."

27. The ship calls the station or stations on the appropriate wave, making "QTE ?" in conjunction, if necessary, with the call signals of the stations from which bearings are required and also (if the call is NOT made on 450 metres) by the figures "450," signifying that the ship will shift to 450 metres for the taking of the bearing. The ship then awaits instructions.

Example 1.

A ship whose call signal is XYZ requires bearings from Amlwch (BXV) and Rhyl (BZW).

The ship, having first shifted to 450 metres, calls Amlwch thus:—

C̅T̅ BXV BXV de XYZ QTE BXV BZW ?

She then awaits instructions.

Example 2.

The ship requires a bearing from Seaview (BXK). The ship has to use 600 metres to call Malin Head (GMH).

She calls on 600 metres, thus:—

C̅T̅ GMH GMH de XYZ QTE BXK ? 450.

She then gets ready to shift to 450 metres and awaits instructions.

28. The station or stations called then make the necessary arrangements and, when ready, answer in alphabetical order of their call signals (if more than one was originally called) and make "K" (go on) preceded by "450" if 450 had been made in the original call.

Example 1.

Amlwch, in Example 1 above, warns Rhyl by land line and, when both are ready, makes on 450 metres:—

C̅T̅ XYZ de BXV K.

Example 2.

Malin Head, in Example 2 above, warns Seaview by land line and then makes on 600 metres:—

C̅T̅ XYZ de GMH 450 K.

Malin Head then shifts to 450 metres so as to be ready to give the result when received by wire from Seaview.

29. On receiving "K," the ship, having shifted transmitting wave to 450 metres (if not already done), then makes her own call signal for 45 seconds and awaits the result.

Example 1.

The ship, in Example 1 above, makes on 450 metres:—

C̅T̅ BXV de XYZ XYZ XYZ, etc. (for 45 seconds) XYZ.

Example 2.

The same as Example 1, reading GMH for BXV.

30. The station or stations then reply (in alphabetical order if more than one) either

asking the ship to repeat (?) or giving the result The result is given by the signal QTE followed as necessary by the call signal and by a group of *three* figures (000 to 359) indicating the true bearing from 0° to 359°, reckoned as in paragraph 14, of the ship *from* the station. Several bearings can be combined into one message, each bearing immediately following the call signal of the station which took it. The time of handing in is always expressed in Greenwich mean time for all messages giving bearings to merchant ships.

Example 1.

Rhyl, in Example 1 above, is not satisfied with the bearing and informs Amlwch. Amlwch makes on 450 metres :—

C̄T̄ XYZ de BXV ?

The ship at once complies by making on 450 metres :—

C̄T̄ BXV de XYZ XYZ XYZ, etc.
(for 45 seconds) XYZ.

Rhyl is then satisfied that the bearing is 340° and informs Amlwch, while Amlwch finds that its own result is 37°. Amlwch therefore makes on 450 metres :—

C̄T̄ XYZ XYZ de BXV 1 9.45 M (time)
—QTE BZW 340 BXV 037+BXV.

Example 2.

Seaview, in Example 2 above, gets a satisfactory bearing of 329° and informs Malin Head. The latter makes on 450 metres :—

C̄T̄ XYZ XYZ de GMH 2 10.46 S (time)
—QTE BXK 329+GMH.

Example 3.

Had the ship merely asked Lizard (BVY) for a bearing, Lizard, finding it to be 246°, would make on 450 metres :—

C̄T̄ XYZ XYZ de BVY 1 7.6 M (time)
—QTE 246+BVY.

31. The ship, on receiving the result, acknowledges receipt in the ordinary way, and makes the "end of work" sign. This sign is then repeated by the station or stations concerned. It is important that the "end of work" sign should not be omitted, since it not only indicates that the operation is finished, but it also shows that all concerned are about to resume watch on their normal wave.

Regulations for French D.F. Stations.

32. The following D.F. stations are established :—

Station.	*Call Signal.*	*Latitude. N.*			*Longitude.*		
		°	′	″	°	′	″
Le Havre	FFU	49	31	30	0	07	00 E.
Bernières	UHN	49	20	00	0	25	00 W.
Cherbourg	FFC	49	36	32	1	36	00 W.
Tréguier	FQC	48	50	08	3	13	56 W.
Ouessant—Pen ar Roch *	FHY	48	26	27	5	05	33 W.
Brest—Guipavas	FHA	48	27	00	4	26	30 W.
Brest—Capucins †	HUD	48	19	12	4	34	48 W.
Pointe du Raz	EPU	48	02	22	4	43	52 W.
Lorient	FFL	47	44	05	3	20	45 W.
Chémoulin §	FUH	47	14	06	2	17	54 W.
Rochefort—Soubise	HOB	45	56	00	1	00	00 W.
Barre de l'Adour	FLO	43	31	40	1	31	20 W.
Casablanca—Chetaba ‡	FCH	33	35	21	7	34	10 W.

* Ouessant—Pen ar Roch answers FFF.
† Brest—Capucins answers FFK.
‡ Casablanca—Chetaba answers CNP.
§ Chémoulin closed pending transfer to Ville-ès-Martin; near St. Nazaire, of which further notice will be given.

33. The regulations for French D.F. stations are similar to those for the United Kingdom.

Regulations for Italian D.F. Stations.

34. The following D.F. station is established :—

Station.	*Call Signal.*	*Latitude. N.*			*Longitude. E.*		
		°	′	″	°	′	″
Murano	IRM	45	27	40	12	21	22

Note.—The above station cannot answer the calls from ships, but is in direct communication by telegraph with the W.T. station Carbonera (ICZ).

35. Vessels wishing to obtain bearings from Murano D.F. station must call up Carbonera station, and the latter, having obtained the required information from Murano, will duly transmit it to them. The bearings are True, and are given in degrees from 0° to 359°.

36. **The procedure is as follows :—**
A ship whose call signal is ABC wishes a bearing.
On a wave of 600 metres she will signal :—

CT ICZ ICZ de ABC QTE ?

Carbonera will answer :—

CT ABC de ICZ AS .

Carbonera then wires Murano ; when ready, Carbonera replies :—

CT ABC de ICZ K 6.

ABC, after 30 seconds, signals :—

CT ICZ de ABC ABC ABC etc., for 45 seconds.

37. **If dissatisfied with the bearing, Murano through Carbonera will ask the ship to repeat.**
Carbonera signals :—

CT ABC de ICZ UD.

ABC repeats the signal as given above.

38. **When satisfied with the bearing,** which is assumed to be 170°, at 9.45, Murano will transmit it by telegraph to Carbonera, whence it is passed to the ship as follows :—

CT ABC de ICZ de IRM 9.45 M BT QTE 170 AR ICZ.

ABC acknowledges receipt :—

CT ICZ de ABC R SK.

REGULATIONS FOR GERMAN D.F. STATIONS.

39. The following D.F. stations on the German North Sea Coast are established. The stations belong to the State Marine but are also available for public use :—

Station.	*Call Signal.*	*Latitude. N.*			*Longitude. E.*		
		°	′	″	°	′	″
Wilhelmshaven *	KAN	53	31	00	8	09	30
List	VBD	55	00	12	8	23	12
Nordholz	MNF	53	47	06	8	38	30
Borkum	FNR	53	34	55	6	40	54

* Control station.

40. (*a*) A ship (call sign ABC) requiring a bearing from each of the three stations, the following procedure is to be employed :—

CT KAN KAN KAN DE ABC AR
CT ABC ABC ABC DE KAN AR K
CT KAN DE ABC BT QTE AR
CT ABC DE KAN VE AS
CT FNR FNR FNR MNF MNF MNF
VBD VBD VBD DE KAN BT PEILUNG (Bearing)
600 m—WELLE ABC (metre wave)
CT ABC DE KAN BT BITTE VV GEBEN AR (Please send V's)
CT KAN DE ABC BT V's . . . . . ABC AR
CT FNR MNF VBD DE KAN AR K
CT KAN DE FNR BT PEILUNG ABC . . . GRAD (Bearing) (Degrees)
FNR 1018 AR
Similarly MNF and VBD pass their bearings to KAN
CT FNR MNF VBD DE KAN VE
CT ABC DE KAN BT PEILUNG 1018 ? AR K (Have you received Bearing)
CT KAN DE ABC VE VE AR SK
CT ABC DE KAN VE SK
CT FNR MNF VBD DE KAN SK

(*b*) **A ship (call sign ABC) requiring her position to be obtained by means of bearings from the three stations, the following procedure is to be employed :—**

With the exception that QTF is substituted for QTE the procedure is as in (*a*) above until the three stations have passed the bearings to KAN.

KAN then makes to ABC :—

CT ABC DE KAN BT IHR STANDORT NACH
(your position by means of
FUNK PEILUNG UM 1018 IST——GRAD
bearings at is degrees
——MIN——SEK NORD-BREITE
minutes seconds north
——GRAD——MIN——SEK OST-LÄNGE
degrees minutes seconds east)
AR K

The procedure is then as in the last 3 lines of (*a*) above.

41. *Note.*—Mid-European time is used, the hours and minutes being expressed in four figures from 0000 to 2359.

Note.—This Notice is a revision of former Notice No. 363 of 1920.

(*Notice No.* 838 *of* 1920, *dated May* 22*nd.*)

ADMIRALTY NOTICE TO MARINERS.
No. 952 OF JUNE 15TH, 1920.
FIXING POSITION BY WIRELESS DIRECTIONAL BEARINGS.

I.—GENERAL.

Fixing position by directional wireless is very similar to fixing by cross bearings from visible objects, the principal difference being that, when using a chart on Mercator's Projection allowance has to be made for the curvature of the earth, the wireless stations being generally at very much greater distances than the objects used in an ordinary cross bearing fix.

Although fixing position by wireless directional bearings is dependent for its accuracy upon the degree of precision with which it is at present possible to determine the direction of wireless waves, subsequent confirmation of the course and distance made good, by the receipt of additional bearings, would afford confidence to those responsible in the vessel as the land is approached under weather conditions that preclude the employment of other methods.

At the present time, from shore stations with practised operators and instruments in good adjustment, the maximum error in direction should not exceed 2° for day working, but it is to be noted that errors at night may be larger, although sufficient data on this point is not at present available.

II.—TRACK OF WIRELESS WAVE.

The track of a wireless wave being a great circle is represented on a chart on Mercator's Projection by a flat curve, concave towards the equator; this flat curve is most curved when it runs in an east and west direction and flattens out as the bearing changes towards north and south. When exactly north and south it is quite flat and is then a straight line, the meridian. The true bearing of a ship from a wireless telegraphy station, or *vice versa*, is the angle contained by the great circle passing through either position and its respective meridian.

III.—CONVERGENCY.

Meridians on the earth's surface not being parallel but converging at the poles, it follows that a great circle will intersect meridians as it crosses them at a varying angle unless the great circle itself passes through the poles (*i.e.*, is a meridian). The difference in the angle formed by the intersection of a great circle with two meridians (*ie.*, convengency) depends on the angle the great circle makes with the meridian, the middle latitude between the meridians and the difference of longitude between the meridians.

This difference is known as the convergency and can be approximately calculated from the formula :—

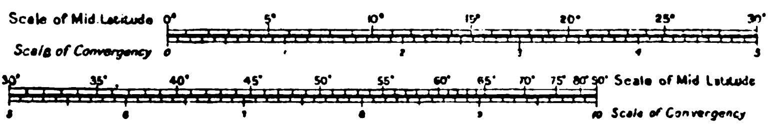
Convergency in mins. = diff. long. in minutes × sin mid. lat.

Convergency may be readily found from the Convergency Scale attached to this Notice, or it may be found by traverse table entering the D. long. as distance and mid. lat. as course ; the resulting departure being the convergency in minutes.

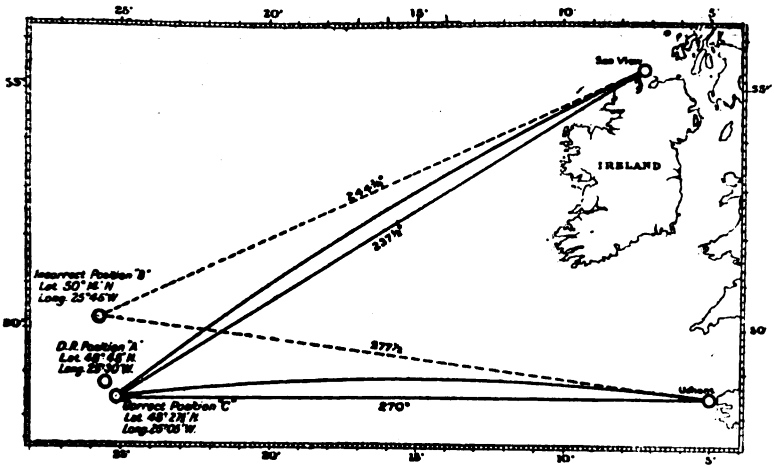
IV.—TRUE AND MERCATORIAL BEARINGS.

Meridians on a Mercator's chart being represented by parallel lines, it follows that the *true bearing* of the ship from the station, or *vice versa*, cannot be represented by a straight line joining the two positions, the straight line joining them being the *mean mercatorial bearing* which differs from the true bearing by ± ½ the convergency. As it is this mean mercatorial bearing which we require, all that is necessary when the true bearing is obtained from a W/T station is to add to or subtract from it ½ the

Scales for obtaining the Convergency for 10' Diff. Longitude in different Latitudes



Example:- *Mid Lat 50°30'. diff. long. 282'. To find the Convergency.*
Under 50°30', on Mid Lat scale read 7.7 on scale of Convergency
which multiplied by 28.2 gives 217'- the Convergency



convergency and lay off this bearing from the station.

Note.—Charts on the Gnomonic Projection which facilitate the plotting of true bearings are now in course of preparation.

V.—Sign of the ½ Convergency.

Provided the bearings are always measured in degrees north 0° to 360° (clockwise) the sign of this ½ convergency can be simply determined as follows:—

N. lat. - ½ convergency is + to the bearing by the W/T station when ship is E. of station.

N. lat. - ½ convergency is − to the bearing given by the W/T station when ship is W. of station.

S. lat. - The opposite.

When the W/T station and the ship are on opposite sides of the equator, the factor sin mid. lat. is necessarily very small and the convergency is then negligible. All great circles in the neighbourhood of the equator appear on the chart as straight lines and the convergency correction as described above is immaterial and unnecessary.

VI.—Example.

A ship is by D.R. in lat. 48° 45′ N., long. 25° 30′ W., and obtains wireless bearings from Seaview 244¾° and from Ushant 277½°. What is her position?

Sea View -	Lat. 55° 22′ N.	Long. 7° 19½′ W.
D. R. -	„ 48° 45′ N.	„ 25° 30′ W.
Mid Lat. -	52° 03′ N.	Diff. long. 1090.5′

Convergency = 1090.5 × sin 52° = 859′ or ½ convergency = 7° 09′.

The true bearing signalled by Sea View was 244¾°, as ship is west of the station (North lat. see paragraph V.), the ½ convergency will be "minus" to the true bearing signalled.

Therefore the mercatorial bearing will be 237½° nearly.

Similarly with Ushant.

Lat. D. R. - -	48° 45′ N.	Long. 25° 30′ W.
„ Ushant -	48° 26½′ N.	„ 5° 05½′ W.
Mid lat. - -	48° 36′ N.	Diff. long. 1224.5′ W.

Convergency 1224.5 × sin 48° 36′ = 919′ or ½ convergency = 7° 40′

The true bearing signalled by Ushant was 277½°, as ship is west of the station (North lat. see paragraph V.), the half convergency will be "minus" to the true bearing signalled. Therefore the mercatorial bearing will be 270° nearly.

Laying off 237½° and 270° on the chart from Sea View and Ushant respectively the intersection will be in:

Lat. 48° 27½′ N., long. 25° 05′ W., which is the ship's position.

Note.—In plotting the positions the largest scale chart available that embraces the area should be used. A station pointer will be found convenient for laying off the bearings where the distances are great.

The accompanying chartlet drawn on the Mercator's Projection shows the above positions and the error involved by laying off the true bearings as signalled from Sea View W/T station and Ushant W/T station.

The curved lines are the great circles passing through Sea View and ship's position and Ushant and ship's position.

The pecked lines are the true bearings laid off as signalled, their intersection (B) being in lat. 50° 14′ N., long 25° 46′ W., or approximately 110′ from the correct position.

The straight lines are the mean mercatorial bearings laid off from Sea View and Ushant and their intersection (c) gives the ship's position very nearly, *i.e.*, lat. 48° 27½′ N., long. 25° 05′ W.

Position A is the ship's D.R. position, lat. 48° 45′ N., long. 25° 30′ W., which was used for calculating the ½ convergency.

Note.—As the true position of the ship should have been used to obtain the ½ convergency, the quantity found is not correct, but it could be recalculated using lat. and long. (c) and a more correct value found. This, however, is only necessary if the error in the ship's assumed position is very great.

VII.—Accuracy of this Method of Plotting.

Although this method is not rigidly accurate, it can be used for all practical purposes up to 1,000 miles range, and a very close approximation found to the lines of positions upon which the ship is at the moment the stations receive her signals.

The following stations are established in Great Britain:—

Station.	Wave-length.	Call Sign.	Latitude N. ° ′	Longitude W. ° ′
Amlwch (a) *	450 metres	BXV	53 24	4 18
Berwick	450 metres	BVG	55 42	1 54
Carnsore	450 metres	BVZ	52 12	6 21
Flamborough	450 metres	BVN	54 07	0 05
Larne	450 metres	BXJ	54 51	5 48
Lizard	450 metres	BVY	49 59	5 12
Peterhead *	450 metres	BVL	57 34	1 49
Rhyl (a)	450 metres	BZW	53 18	3 29
Seaview (b) (Malin Head)	600 metres	BXK	55 22	7 19

* Now closed.

VIII.—Use of W/T Bearings with Observations of Heavenly Bodies.

It follows that W/T bearings may be used in conjunction with position lines obtained from observations of heavenly bodies, the position lines from the latter being laid off as straight lines (although in this case also they are not strictly so), due consideration being given to the possible error of the W/T bearings. Moreover, W/T bearings can be made use of at short distances as "position lines" in a similar manner to the so-called "Sumner-line" when approaching port, making the land, avoiding dangers, etc.

IX.—Converse Method.

When ships are fitted with apparatus by which they record the wireless bearings of shore stations whose positions are known, the same procedure for laying off bearings from the shore stations can be adopted, but it is to be remembered that in applying the ½ convergency to these bearings it must be applied in the converse way, in both hemispheres, to that laid down in paragraph V.

(Notice No. 952 of 1920.)

AIR MINISTRY NOTICE TO AIRMEN,

No. 103, Dated September 30th, 1920.

ROYAL NAVY WIRELESS DIRECTION FINDING STATIONS.

It is hereby notified:—

S 1. Aircraft may use the Wireless Direction Finding Stations operated by the Royal Navy, under the conditions laid down for the use of these stations by the Mercantile Marine, in Admiralty "Notice to Mariners," No. 524, of March 25th, 1920.

Note.—(a) Rhyl is not fitted with transmitting apparatus, and is controlled by Amlwch.
(b) Seaview has no transmitting apparatus, and is controlled by Malin Head (GMH), which keeps watch on 600 metres.

2. The actual procedure to be adopted by aircraft requiring bearings will depend upon what stations are concerned. It should be observed that if the stations to be called do not all keep watch on the same wave (*e.g.*, Lizard and Carnsore), they should be called up together, and the bearings taken in one operation. If, however, two or more stations are linked by special land lines (*e.g.*, Amlwch and Rhyl) only one of them should be called up. In such cases, however, the aircraft must specify in the preliminary signal the D.F. stations which are required to supply bearings.

3. The following abbreviations are to be used:—

Signal.	*Meaning.*
QTE? ..	"What is my true bearing from you (or from ——)?"
QTE ..	"Your true bearing from me (or from ——) was —— degree."

4. The aircraft calls the station or stations on the appropriate wave, making "QTE?" in conjunction, if necessary, with the call signals of the stations from which bearings are required; and also (if the call is NOT made on 450 metres) by the figures "450," signifying that the aircraft will shift to 450 metres for the taking of the bearing. The aircraft then awaits instructions.

Example 1.

An aircraft whose call signal is XYZ requires bearings from Amlwch (BXV) and Rhyl (BZW).
The aircraft, having first shifted to 450 metres, calls Amlwch thus:—

C̄T BXV BXV de XYZ QTE BXV BZW?
The aircraft then awaits instructions.

Example 2.

The aircraft requires a bearing from Seaview (BXK). The aircraft has to use 600 metres to call Malin Head (GMH).
The aircraft calls on 600 metres, thus:—

C̄T GMH GMH de XYZ QTE BXK? 450
The aircraft then gets ready to shift to 450 metres and awaits instructions.

5. The station or stations called then make the necessary arrangements, and, when ready, answer in alphabetical order of their call signals (if more than one was originally called), and make "K" (go on) preceded by "450" if 450 had been made in the original call.

Example 1.

Amlwch, in Example 1 above, warns Rhyl by land line, and, when both are ready, makes on 450 metres.:—

C̄T XYZ de BXV K.

Example 2.

Malin Head, in Example 2 above, warns Seaview by land line and then makes on 600 metres:—

C̄T XYZ de GMH 450 K.

Malin Head then shifts to 450 metres, so as to be ready to give the result when received by wire from Seaview.

6. On receiving "K," the aircraft, having shifted transmitting wave to 450 metres (if not already done), then makes her own call signal for 45 seconds, and awaits the result.

Example 1.

The aircraft, in Example 1, para. 4, makes on 450 metres :—

C̄T̄ BXV de XYZ XYZ CYZ, etc. (for 45 seconds) XYZ.

Example 2.

The same as Example 1, reading GMH for BXV.

7. The station or stations then reply (in alphabetical order if more than one) either asking the aircraft to repeat (?) or giving the result. The result is given by the signal QTE, followed, as necessary, by the call signal and by a group of three figures (000 to 359) indicating the true bearing from 0° to 359° of the air craft from the station. Several bearings can be combined into one message, each bearing immediately following the call signal of the station which took it. The time of handing in is always expressed in Greenwich mean time for all messages giving bearings to aircraft.

Example 1.

Rhyl, in Example 1 above, is not satisfied with the bearing and informs Amlwch. Amlwch makes on 450 metres :—

C̄T̄ XYZ de BXV ?

The aircraft at once complies by making on 450 metres :—

C̄T̄ XYZ de XYZ XYZ XYZ, etc. (for 45 seconds) XYZ.

Rhyl is then satisfied that the bearing is 340° and informs Amlwch, while Amlwch finds that its own result is 37°. Amlwch therefore makes on 450 metres :—

C̄T̄ XYZ XYZ de BXV 1 9.45 M (time) =QTE BZW 340 BXV 037+BXV.

Example 2.

Seaview, in Example 2 above, gets a satisfactory bearing of 329° and informs Malin Head. The latter makes on 450 metres :—

C̄T̄ XYZ XYZ de GMH 2 10.46 S (time) =QTW BXK 329+GMH.

Example 3.

Had the aircraft merely asked Lizard (BVY) for a bearing, Lizard, finding it to be 246° would make on 450 metres :—

C̄T̄ XYZ XYZ de BVY 1 7.6 M (time) =QTE 246+BVY.

8. The aircraft, on receiving the result, acknowledges receipt in the ordinary way, and makes the "end of work" sign. This sign is then repeated by the stations concerned. It is important that the "end of work" sign should not be omitted, since it not only indicates that the operation is finished, but it also shows that all concerned are about to resume watch on their normal wave.

9. Further information on this subject is contained in Admiralty "Notices to Mariners," Nos. 363 of February 25th, 1920; 524 of March 25th, 1920, and 838 of May 22nd, 1920, which should be consulted.

By Command of the Air Council,
W. F. Nicholson.

Air Ministry, London, W.C. 2,
September 30th, 1920.

GREECE

One of the oldest maritime countries in the world, the kingdom of Greece lies in latitude 34° 45′43° N., its longitude stretching between 19° 20′28° 30 E.

The State consists (*a*) of the southern part of the Balkan Peninsula, including all Thrace (except a small area round Constantinople), (*b*) of western Asia Minor, and (*c*) of islands in the Ægean, Mediterranean and Ionian Seas.

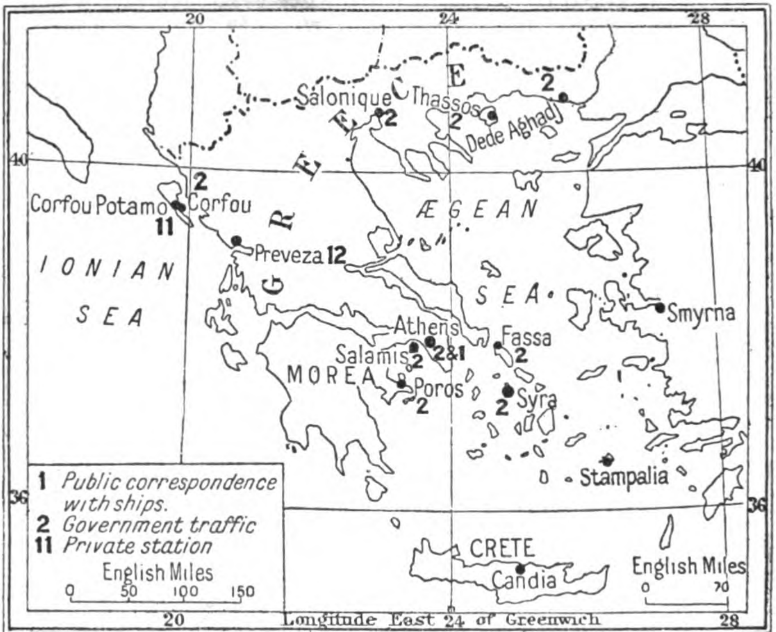
CONTROL.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
P. Mavromichalis	Minister of the Navy	Amalia Avenue, Athens
Com. R.N. P. Joannides ..	Head of the Radiotelegraphic Service	Parnithos & TenedouSt., Athens
Com. R.N. Gr. Mezeviris, Radioengineer of the "Ecole Superieure d'Electricité"	First Assistant to Head of Radio Service.	24, Ithakis St., Athens

ORGANISATION.

The Greek Ministry of the Navy, following the lead of other countries, took up the question of wireless seriously in 1909, when Capt. Athanasiadis, the present head of the Radio Service (an officer of the Navy), was sent to England at the head of a Mission for the construction of different stations. The first wireless land station was erected at Athens, and completed in February, 1911, and several other stations were installed on ships of the Navy. It was only during the Balkan War (1912–1913) that other land stations were erected, the Athens station being the only land station in Greece up to that moment



A new scheme of coast wireless stations has been laid down since the recent increase of territory, and is to be completed within four years. This scheme includes more than twenty stations.

The following is a summary of the wireless stations under the control of the Greek Authorities :—

Athens No. 1 (Government traffic), Athens No. 2 (Public correspondence with ships), Athens No. 3 (New station not yet open to public correspondence), Fasse, Cerfu-Potamo, Salonica, Salamia, Poros (Government traffic), Smyrna (not yet completed), Dedcagatch (Thrace Government traffic), Candia (Crete, not yet completed).

For the present the Athens station, No. 2, is the only one open to public service. During the present year other coast stations are to be opened to the public service.

A powerful station will soon be completed near Athens, communicating direct with all other European countries.

The transmission of meteorological, aviation and time signals is shortly to be placed on new bases. A press message is transmitted from the new station at Athens at 1500 G.M.T.

Wireless Societies or Clubs.—The Union of Greek Telegraphists is the only organisation of persons interested in wireless.

The Société Anonyme Internationale de Télégraphie sans Fil of Brussels is the only company erecting and working stations on merchant ships.

ADMINISTRATION.

A—Law, 1831, passed January 14th, 1920.
B—Regulation on the Wireless Service of the Merchant Fleet.
C—Form of Ship-License.
D—Form of Radio-operator's License.

LAW 1831.

A Concerning the organisation of the Radiotelegraphic and Radiotelephonic Service of the State and the formation of a Directorate of Radiotelegraphic Service of the Navy.

Passed, January 14th, 1920.

CHAPTER A.

General Clauses concerning the Radiotelegraphic and Radiotelephonic Service of the State.

ART. 1.—The installation and operation of Radiotelegraphic and Radiotelephonic Stations on Hellenic territory and on board Hellenic ships constitutes a State monopoly.

ART. 2.—The State may grant permission to private individuals to instal and operate radio-stations on land and on board ships under conditions specified in the license. Any such licence may be revoked or the conditions under which same has been granted be altered when the station interferes with the working of Government Stations or does not fulfil the conditions under which the license has been issued.

In time of mobilization of the naval or military forces the license for the operation of private stations may be revoked without notice.

The State may take possession of private stations for its own use in mobilisation time after paying compensation as mentioned in the license.

The State reserves to itself the right to purchase any private station in time of peace and if the license be revoked in accordance with the first paragraph of the present article after a certified decision of the permanent advisory board as in Article 8, compensation is fixed by a council of arbitrators composed of three members, one chosen by the competent Ministry, the second by the owner, and the third by the President of the Athens Court of Appeal.

If more than one owner is interested and these do not agree as to the choice of an arbitrator, each of them shall propose one, and the arbitrator shall be chosen from them by ballot in the presence of the arbitrator chosen by the President of the Court of Appeal.

Such a Council settles definitely any dispute regarding compensation due for the temporary seizure of the station.

ART. 3.—Radiotelegraphists operating private wireless stations must be in possession of a licence issued by the State after successful examination, and undertake the obligation to preserve the secrecy of correspondence.

Licenses are valid for a term of three years and a stamp of 10 Drs. is affixed to them. When Greek subjects are concerned, the application for the issue of the license must be accompanied by certificates proving that the applicant is not a deserter from Government Forces and has not been convicted in accordance with Article 22 of the Penal Code.

Licences for Radiotelegraphists issued before the promulgation of this law are not valid after the lapse of one year.

ART. 4.—Shall be liable to a penalty not exceeding 20,000 Drs. and to imprisonment for a term not exceeding one year.

1. Every person who establishes a radio-station or sets any radio-apparatus on land or on board ship without a license.

2. Any person employing an operator not holding a State license.

3. Any person violating the terms under which the license of installation of wireless station has been granted.

4. Any person who sends or transmits any fraudulent distress signal or who without lawful excuse interferes with or obstructs any radio communication of other stations as well as persons exhorting operators to transmit such signals.

5. Any person causing damage or destruction to the radio-apparatus.

6. Any person violating the regulations in force.

7. Any person violating the due secrecy of the radio communication.

The above penalties are imposed by the Athens Court of First Instance on the action of the competent Minister without excluding any penalty provided by the Penal Code or by the Military Penal Code in the event of a Military case.

The same Court can order the confiscation of the station whenever it might be deemed desirable according to circumstances.

In addition to the above penalties the Minister can order when he takes cognisance of such infringement of the above regulations, a temporary cessation of the service of the station confiscated, also the set and any apparatus necessary to the wireless service.

The license of an operator punished by the Court for one of the above cases is suspended temporarily or permanently on the judgment of the Court. Should the competent Minister think that the infringement effected by the operator is not serious as to demand action, or in the event of the operator being guilty of negligence, the Minister may punish him by suspending his license for a period not exceeding three months.

ART. 5.—The land stations of the State are divided into two classes :—

(*a*) Inland Radio-stations for the transmission of official or private correspondence with ship stations or other Inland or Coast Stations of the State or Stations abroad providing that there are no private Wireless Stations.

(*b*) Shore or Coast Radio-stations for the transmission of official or private correspondence to ships or other coast and land stations in the State or abroad, providing that there are no private stations for wireless correspondence.

The Government stations on board ships are divided into two classes :

(*a*) Stations on board warships.

(*b*) Stations having been specially installed by the State on board merchant ships, exempted by the present law for the ships, particular use.

ART. 6.—All wireless telegraphic subjects come under the special jurisdiction of the Ministries of Marine, of Communications, and of National Economy, who are kept *au courant* with wireless telegraphic questions in connection with merchant shipping by their representative and member to the Advisory Board (provided for by Article 8). The Director of the Merchant Shipping Department, or by direct communication of the Marine Minister providing special arrangements are made.

The following come under the special jurisdiction of the Minister of Communications :—

(*a*) The installation and operation of the land stations.

(*b*) The issue of licenses for the installation and operation of private land stations, the inspection and supervision of their operation, the observance of the regulations in force

and the conditions stipulated in the license. of these stations upon decision of the board provided for in Article 8.

(*c*) The control and payment of accounts for private radiograms transmitted by stations under his jurisdiction, or that of the Minister of Marine who in turn transmits full information concerning the subject.

For this purpose the staff of the office of the Ministry of Communications shall be fixed by special Royal Decree.

The following come under the jurisdiction of the Ministry of the Navy :—

(*a*) The installation and operation of the coast stations, of warship stations, and stations of the State on merchant vessels.

(*b*) The issue of licenses for the installation and operation of private stations on merchant vessels and private coast stations after consultation with the Advisory Board, the inspection and supervision of their operation, the observance of the regulations and conventions in force and conditions stipulated in the license of the station.

(*c*) The issue of licenses to the operator of all stations.

(*d*) The control of ships or land stations and the observance of rules and conventions shall be fixed by Royal Decree and special regulations.

(*e*) As coast or shore stations are considered all stations installed a small distance from the coast if they keep up Naval radio-communication.

ART. 7.—Temporarily and until the formation of a Technical Service has been effected at the Ministry of Communications all matters under its jurisdiction except those stipulated in Chapter C will pertain to the Ministry of Marine.

A permanent Advisory Board is established at the Ministry of the Navy, composed of the Head of the General Staff of the Navy, as Chairman, the Director of Posts and Telegraphs, the Director of the Radio-Service of the Navy, the Head of the Radio Department of the Ministry of Communications, and one officer of the Army General Staff appointed by the Chief of the Staff, and of the Director of the Merchant Shipping Department in the Ministry of National Economy.

This Board considers :—

(*a*) The necessity for the erection of land stations.

(*b*) The issue of licenses for the installations of private stations in the interior or on the coast and the cancellation of such licences.

(*c*) Matters pertaining to International Conventions.

(*d*) Questions arising between different services.

(*e*) Any relative matter brought forward by the Ministers of the Navy and Communications or of the Ministry of National Economy.

ART. 9.—The coast station charges and ship charges are fixed by Royal Decree according to circumstances after the consultation with the Advisory Board.

CHAPTER B.

CONCERNING THE RADIO-SERVICE ON BOARD MERCHANT SHIPS.

ART. 10.—All Greek merchant ships of 1,600 gross tonnage and over, and ships of less tonnage if they carry fifty or more persons including crew, must be fitted with a radiotelegraph set. The following are exempted from the above obligation :—

(*a*) Cargo-boats and sailing vessels whose voyages are not extended to an ocean.

(*b*) Passenger ships whose voyages are included in the parallelogram limited by 34° 0′ to 42° 20′ north latitude and the meridians 17° 0′ to 30° 0′ east of Greenwich, Passenger boats below 500 gross tonnage, undertaking fixed voyages further than the meridian 30° east of Greenwich, but in the area included by the above parallelogram, may also be exempted by decision of the Ministers of the Navy and National Economy.

In reckoning the number of persons stated in the first paragraph of this article, there are not included persons embarked exceptionally and temporarily as the result of *force majeure*, or because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry ship-wrecked or other persons.

ART. 11.—The power of the wireless sets provided for in the foregoing article will be defined in the license and shall be able to transmit signals clearly under normal circumstances at a distance of at least 100 nautical miles in addition they shall be equipped with an emergency gear which elements shall be under the greatest safety conditions.

ART. 12.—The clearance of ships, subject according to Article 10 to carry a wireless set, and not being fitted therewith, is prohibited by the harbour authorities. The acceptance of Greek passengers on ships of foreign nationality which are not equipped with wireless is also prohibited for voyages where Greek ships are required to be equipped.

ART. 13.—Merchant ships exempted from the obligation to be fitted with a wireless set, may be fitted with State apparatus for purposes of the War-Navy. All expenses of installation and maintenance of the necessary staff for the operation being reserved to the competent Ministry.

ART. 14.—All ship radio-charges are deducted from the general radio-charges and belong to the shipowner or to any person having the exploitation of the radio-station under special arrangement with the shipowner.

In cases where the ship helps in salvage or affords assistance to another ship in consequence of a radiogram the shipowner is required to pay to the State 10% of the net sum which he obtains for salvage, but only if the apparatus belongs to the State. This sum being devoted to the Naval *Caisse des Invalides*.

CHAPTER C.

CONCERNING THE RADIO-SERVICE OF THE NAVY.

ART. 15.—A Direction of Radio-Service of the Navy is formed in the Ministry of the Navy under the immediate orders of the Minister of Marine and to which, in addition to matters specified in Article 6 of this law, are subject: The enlistment, training, appointment and alterations of the staff serving on stations subject to the jurisdiction of the Ministry of the Navy or any other relative matter to be fixed by Royal Decree.

(*Further articles concern the special service of the Naval Radio-Corps.*)

REGULATION OF WIRELESS SERVICE ON MERCHANT SHIPS.

CHAPTER I.

SHIPS BOUND TO BE FITTED WITH RADIOTELEGRAPH INSTALLATION.

B

1. All Greek merchant ships of 1,600 gross tonnage and over, and ships of less tonnage, if they carry fifty or more persons including crew, must be fitted with a radiotelegraph set. The following are exempted from the above obligation :—

(*a*) Cargo-boats and sailing vessels whose voyages are not extended to an ocean.

(*b*) Passenger ships whose voyages are included in the parallelogram limited by 34° o' to 42° 20' north latitude, and the meridians 17° o' to 30° o' east of Greenwich. Passenger boats below 500 gross tonnage, undertaking fixed voyages further than the meridian 30° east of Greenwich, but in the area included by the above parallelogram may also be exempted by decision of the Ministers of the Navy and National Economy.

In reckoning the number of persons stated in the first paragraph of this article there are not included persons embarked exceptionally and temporarily as the result of *force majeure*, or because the master is under the necessity of increasing the number of his crew to fill the places of those who are ill, or is obliged to carry ship-wrecked or other persons.

2. The power of the wireless station on merchant ships is fixed by the Direction of the Radiotelegraphic Service of the Navy (D.R.S.N.) and is prescribed in the license according to the voyages undertaken by the various ships. As a minimum limit should be taken the clear transmission of signals to a distance of at least 100 naval miles under normal conditions. In addition merchant ships must be fitted with an emergency set, the whole system of which must be kept in the safest condition. The accumulators must be placed out of the wireless cabin and if possible in the open air in dry cases. The wireless cabin must be connected with the bridge by some safe means assuring verbal communication.

3. Each shipowner, obliged by this law to instal a radiotelegraph station on his ship, must submit an application to the D.R.S.N. (Inspection Department) for the necessary licence.

In the application the following items of the ship must be prescribed :—

(1) Dynamo—how moved and where placed.
(2) Masts—distance between and height.
(3) Capacity (deadweight).
(4) Passenger or cargo.
(5) Number of crew.
(6) Voyages undertaken.
(7) System of the radiotelegraphic station to be installed.
(8) Length of aerial.
(9) Wave system.
(10) Wavelengths used.
(11) Emergency set.

After the installation the shipowner submits to the D.R.S.N. :—

(1) Small drawing of the aerial.
(2) Small drawing of the connections.
(3) Disposition of the set in the cabin.

The responsibility for the accuracy of these certificates is borne wholly by the shipowner.

The D.R.S.N. on granting the necessary license can accept the above items or change them, the shipowner being obliged to comply with the suggestion of the D.R.S.N.

4. Shipowners not bound by law and wishing to instal a radio set on their ships must apply by a similar application as above.

5. The D.R.S.N. on granting a license assigns the call letters to the station.

6. Merchznt ships are divided into three classes, A, B, C, as regards the wireless installation :—

Class A.—To this class belong all the passenger ships travelling at a distance of more than 200 miles from the coasts. The ships of this class must be in permanent watch.

Class B.—To this class belong all other ships which are bound by law to be fitted with a radiotelegraphic installation; the ships of this class are bound to keep limited warch during the voyage which is regulated in accordance with the needs of the voyage. In any case the station of these ships must be in watch the first ten minutes of each hour.

Class C.—To this class belong all ships fitted with wireless installation without being bound by law. The station of these ships have no fixed watches.

CHAPTER II.

SERVICE OF WIRELESS STATION ON MERCHANT SHIPS.

9. The wireless stations service of Greek merchant ships must be carried out by telegraphists holding a Greek license granted in accordance with Law 1831 by the D.R.S.N.

10. The stations of ships of class A are served by two operators at least, holding a first-class licence.

11. The stations of ships of class B are served by at least one operator holding a first-class license.

In cases where no second operator is carried a member of the crew must be able to understand the distress signal or the call of another station, so that he may at once inform the telegraphist. Such skill of the said man of the crew shall be tested and mentioned in the respective report of the Wireless Inspector.

12. The station of a ship of the C class must be served by at least one operator holding a second-class license.

13. The operator of the ship in charge of the station is responsible for the regular carrying out of the service, the keeping up of books, the cleaning and maintenance in good order of the apparatus. The other operator must obey him.

14. Each merchant ship station must be supplied with the following papers :—

(1) The license for the installation.
(2) A copy of the present Wireless Regulation and of any other subsequent or of any circular concerning the radiotelegraphic service.
(3) A copy of the International Wireless Convention and of annexed regulation.
(4) The official list of wireless stations and alphabetical list of call letters.
(5) Radiogram prints.
(6) A copy of the standing wireless and cable rates and the protocol of the wireless station.
(7) A log-book for the wireless station.

The operator will state from time to time on a slate placed out of the wireless cabin the coast station with which he is in touch.

15. The operator on service shall keep in a log-book of the station a record of all orders received and all other observations connected with the wireless service and any infringement of the regulations.

The log-book of the station will be considered as an official document and it is forbidden to detach leaves therefrom or to use erasers on its pages. It may thus serve as means of proof before the courts and the competent authorities.

16. The wireless station on a merchant ship and the operators serving it are under the direct orders of the captain who regulates their watch on his own responsibility. But the operator is responsible for any signal or call of the station or any message which he receives and has not passed in the protocol of the station.

17. The captains of the merchant ships must take the necessary steps to secure during the voyage the necessary electric power for the transmitting set for the regular service of the station.

18. When the captain, on his own responsibility, forbids communication or orders silence to a station's call, or in general gives orders to the operator contrary to the regulations or hinders the operator in the fulfilment of his duties in any way, the latter must call the captain's attention to the fact, and if the captain insists, the operator must obey stating the fact in his log-book, and as soon as the ship arrives at a Greek port he must report the case to the wireless inspector or in the latter's absence to the harbour master.

19. The correspondence and the service in general of merchant ships is carried out in accordance with the regulations annexed to the International Radiotelegraphic Convention of London and with the present regulation, as well as with any other order of the D.R.S.N.

Operators are also bound to carry out all orders and to comply with the instructions given by the wireless inspector.

20. On no account may a ship station use other call letters than those prescribed in the licence.

21. The transmission of radiotelegrams in harbours or bays in the proximity of coast stations is prohibited.

22. Merchant ship stations are bound to suspend transmission as soon as a coast station requires it. As a general rule the ship stations must comply with the orders given by the coast stations.

23. In time of mobilisation or Naval manœuvres the ship stations must conform to the instructions given by the Greek Navy.

24. Before leaving port the operator in charge of the station must try the working condition of the main and emergency set. This test, however, is carried out by disconnecting the aerial. Whenever the operator thinks it necessary to verify the radiation of the station and its emergency set or the sensitivity of the receiver he applies for it, using the international abbreviation.

25. The operators in charge of merchant ships are bound when they proceed to a Greek harbour, to report at once to the wireless inspector or to the harbour officer all deficiencies of the station and in his personnel.

26. The captain is bound at specified intervals not exceeding four hours to give the operators the position of the ship which is to be constantly suspended under their view in the receiving cabin.

27. The operator receiving (by any means) knowledge of a message dangerous to the interests of the country must report it at once to the captain and to the nearest Government coast station or warship or harbour authorities, and simultaneously must draw up a report embodying the message, the station in communication, and full information on it, which he forwards to the D.R.S.N.

28. If the wireless operator receives a suspicious message for transmission from a passenger, before transmitting it he must ask the permission of the captain.

29. It is forbidden for operators to undertake service at a station not fitted with a regular license.

30. All operators must carry their license in the ship to which they belong.

31. It is forbidden for operators to maintain communication by wireless on subjects not referring to the wireless service.

32. Whenever the operator hears any infringement of the rules, effected by other stations he must report at once the fact with all necessary particulars to the D.R.S.N. and he will record in his log-book exactly what he has heard.

33. It is absolutely forbidden for a third station to interrupt two stations already communicating.

34. As a general rule wireless operators must constantly recognise that it is of their duty to enable the wireless communication to be carried out regularly and not to be absorbed exclusively by the finishing up of their service in the station they belong to.

35. It is forbidden to every person not concerned in the service of the station to enter the wireless cabin.

36. Captains are bound to supply the necessary personnel for the cleaning of the station and the repair of the aerial and of the set and generally to grant all assistance for the maintenance and regular service of the station.

37. Merchant ships operators hold officer's rank of the merchant fleet.

38. Operators on finally landing from a merchant ship must present their license to the captain before landing who endorses on it the capacity and character of the operator as shown during his service period.

CHAPTER III.

PENALTIES FOR THE VIOLATION OF THE LAW AND THE REGULATION.

39. Shall be liable to a penalty not exceeding 20,000 Drs. and to imprisonment for a term not exceeding one year.

(1) Everyone who establishes a wireless station or sets any radiotelegraphic apparatus on land or ship without a license.

(2) Any person employing an operator not holding a State license.

(3) Any person violating the terms under which the license of installation for wireless has been granted.

(4) Any person violating the regulations in force.

(5) Any person who sends or transmits any false or fraudulent distress signals or who without lawful excuse interferes with or obstructs any radio communication of the station.

(6) Any person causing damage or destruction to the radiotelegraph apparatus.

(7) Any person violating the due secrecy of the radio communication.

(8) Any person violating generally any regulation of the rules in force.

40. The above penalties are imposed by the Athens Court of First Instance on the action of the competent Minister without excepting any penalty provided by the penal code or by the military penal code in the event of military case.

41. The same court can order the confiscation of the station whenever it might be deemed desirable according to circumstances.

42. In addition to the above penalties the Minister can order when he takes cognisance of such infringement of the above regulations, a temporary cessation of the service of the station confiscated, also the set and any apparatus necessary to the wireless service.

43. The license of an operator punished by the court for one of the above cases is suspended temporarily or permanently on the judgment of the court. Should the competent Minister think that the infringement effected by an operator is not so serious as to demand such action, or in the event of the operator being guilty of negligence, the Minister may punish him by suspending his license for a period not exceeding three months.

CHAPTER IV.

Inspection of the Wireless Stations of Merchant Ships.

44. In harbours specified by order of the Minister of Marines there are centres for Inspection of wireless in active service.

45. In these centres there are Inspectors of the corps of the wireless operators of the War-Navy to superintend the application of Law 1831, of the International Convention and the Regulations for Wireless Telegraphy which are in force.

46. The Inspectors communicate directly with the harbour officers and co-operate with them in order to enforce the law.

47. The Wireless Inspectors, or failing them, the harbour officers, inspect the ships affected by the law before their departure and verify whether they are fitted with wireless as well as with the necessary personnel and the class of operators in accordance with the law and the present regulations.

48. The Wireless Inspector who discovers an infringement of the law or the regulations reports it simultaneously to the harbour master who either prevents the leaving of the ship in accordance with law or reports the infringement effected to the D.R.S.N. asking for the suspension of the responsible operator or the imposition of a penalty according to the nature of the infringement effected.

The Harbour Master accompanies such report with a detailed report concerning the transgression committed, signed by him and the Wireless Inspector, and if need be accompanied by a sworn statement to this effect, which he may obtain from any person acquainted with the fact. He also submits any other item which might be useful to the court.

49. If the inspection of the ship station is impossible the Inspector or the Harbour Officer can ask for a written statement from the captain testifying that the station is maintained in good condition.

50. The Wireless Inspector can accept as a proof of the efficiency of the set and the capacity of the operators of the ship under examination, radiograms transmitted or received during the lapse of the last voyage to the harbour where they are from a distance of at least 100 miles.

51. For any obstruction or difficulty caused by the captain or other person of the ship with regard to the service and the duties of the Inspectors or the Harbour Officers the captain of the ship will be held responsible and against whom the Harbour Master may at once order legal proceedings to be taken.

52. The captain is responsible if he sail from any harbour where there is an Inspector without having his wireless installation in order or the requisite number of operators.

53. All consequences of the law concerning the infringement of the regulations will be enforced against the captain or the shipowner or against both according to the circumstances.

FORM OF SHIP LICENSE.

KINGDOM OF GREECE.

No.......

Direction of the Naval Radiotelegraph Service.

C In accordance with Law 1831, with the London Wireless Convention of 1912, and with the Regulations on the Wireless Service of the Merchant Fleet, we grant the license for the erection and operation of wireless station on board s.s. .... of......tons deadweight, registered at....................
Belonging to.................. .

The technical particulars of the station are as follows :—

Station Class .... Call letters ....
Power .... System ....
Aerial length .... Wavelength ....
Receiver ....
Emergency set ....
Electric power ....
Staff ....

....

Back Part.

PHOTO

Locality and date of birth..........................
Remarks ....
Signature...

SERVICE CONTROL.

Station Name.	Service Time.	Remarks. Signature of person in charge or of the Captain.

The operation of the station is subject to the provisions of the above laws, conventions and regulations, as well as to provisions of all regulations issued by the Direction of the Naval Radiotelegraph Service.

The present license is valid as long as the London Convention of 1912 is in power, and is revocable for any case referred to in Law 1831.

Athens, the................19..

The Director of the Naval Radiotelegraph Service.

KINGDOM OF GREECE.

No.......

DIRECTION OF THE NAVAL RADIOTELEGRAPH SERVICE.

OPERATOR LICENSE.

...... CLASS.

D Mr.................... has been examined successfully on the following matters :—

(*a*) Operation and regulation of apparatus.

(*b*) Transmission and reading of signals at a speed of at least..........words per minute.

(*c*) Knowledge of the regulations on the wireless communication.

The above-mentioned has undertaken the obligation of maintaining the secrecy of Radio communications, and therefore the present licence is granted owing to which he may undertake Wireless Service in Greek merchant vessels as well as at land stations.

The present license is valid for a term of three years beginning to-day and as long as the London Convention of 1912 is in force.

The present license is temporarily or definitely revocable for any obstruction, according to Article 4 of Law 1831, of which he has knowledge.

Athens the................19..

The Director of the Naval Radiotelegraph Service.

GRENADA

(See map on p. 376.)

GRENADA, and the chain of small islands called the Grenadines, lie between 12° 30′ and 11° 58′ N. latitude, whilst their longitude is included between 61° 20′ and 61° 35′ W. The total area of the colony is estimated at about 85,120 acres. Originally settled by the French, it was definitely ceded to Great Britain in 1783. The control is vested in the Governor, an Executive Council, and a Legislative Council, both consisting partly of nominated and partly of official members. There are no wireless clubs or societies in the colony.

ADMINISTRATION.

Wireless telegraphy is regulated by the following Ordinance and Regulations :—

A—Wireless Telegraphy Ordinance, 1913.

AN ORDINANCE TO CONSOLIDATE AND AMEND THE LAW RELATING TO WIRELESS TELEGRAPHY. SEPTEMBER 1ST, 1913.

A Be it enacted by the Governor with the advice and consent of the Legislative Council of Grenada, as follows :—

1. In this Ordinance " Wireless Telegraphy " means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. (1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

3. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or Foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

4. (1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. If a magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under

this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by the chief of police and named in the warrant and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before the magistrate of the Southern District on the complaint of the chief of police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

7. The Wireless Telegraph Ordinance, and the Wireless Telegraph Amendment Ordinance, 1913, are hereby repealed.

8. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1913.

SCHEDULE.

REGULATIONS.

(i) All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

(ii) In these Regulations "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of his Majesty's Navy, between ships of His Majesty's Navy and Naval stations, or between a ship of His Majesty's Navy or a Naval station and any other wireless telegraph station whether on shore or on any ship.

(iii) No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

(iv) For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

(v) Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

(vi) These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

I assent,

J. HAYES SADLER,
Governor.

August 29th, 1913.

Passed the Legislative Council this fifteenth day of August, in the year of our Lord one thousand nine hundred and thirteen.

C. LIVINGSTON WILSON,
Clerk of Councils.

GUAM

(See map on p. 146.)

GUATEMALA

THE Republic of Guatemala lies south-eastward of Mexico, and is almost shut off from the Atlantic Ocean by British Honduras on the north and by the Republic of Honduras on the south-east. Puerto Barrios and Livingston



Guatemala open for public general correspondence.

constitute the chief ports of the Republic on the Atlantic seaboard; San José (the chief port), Champerico and Ocos on the Pacific. The Republic in its present form was established on March 21st, 1847, after having formed part, for 26 years, of the Confederation of Central America. The Constitution dates from December, 1879, modified in 1885, 1887, 1889, and 1903.

CONTROL AND ORGANISATION.

At the present moment radiotelegraphy is represented by a private Government station at Guatemala City. This installation is nominally under the supervision of the Director of Telegraphs. An American operator named Mr. M. W. Haub is in charge of the Wireless Section.

ADMINISTRATION.

No printed or approved laws and regulations have up to the present been issued in Guatemala to regulate the use of wireless.

No licenses for operators are issued, no press time or weather reports are issued, and there are no aviation or direction finding stations.

HAITI

(See map on p. 463.)

THE Republic of Haiti occupies the western (French-speaking) portion of the Island of San Domingo,* which ranks only second in size to Cuba amongst the West Indian Islands. Its area is estimated at 10,200 square miles.

CONTROL.

The Republic does not itself possess any wireless stations, and has passed no regulations affecting telegraphy. The various stations which do exist in the island all constitute items in the American occupation, and remain under the supervision of U.S.A. officials.

HAWAII

(See United States of America.)

HOLLAND

(See Netherlands.)

HONDURAS (BRITISH)

(See British Honduras.)

HONDURAS (REPUBLIC OF)

HONDURAS is a Republic, proclaimed September 15th, 1821, and is governed under a charter proclaimed October, 1894. The Legislative Power is in the hands of a Congress of Deputies of 42 members, chosen for four years directly by popular vote, in the ratio of one per 10,000 inhabitants. The executive authority rests with the President, nominated and elected by popular vote for four years. The number of electors is about 110,000. The Republic is administered by a Council of six ministers, with the portfolios of Foreign Relations, Government of Justice, War and Marine, Treasury and Public Credit, Public Works and Agriculture, and Education.

The area of the Republic is about 44,275 square miles, which lie between the Atlantic on the north and the Pacific on the south. The Atlantic coast line is the more important, as it forms the seat of the banana industry, and contains the only railroads in the country. The chief towns on the north

* For Wireless Organisation and Laws current in the Dominican Republic see under Santo Domingo.

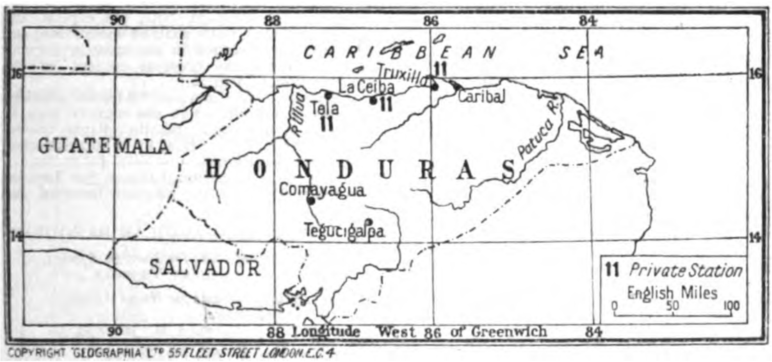
coast are Puerto Cortes (the head of the railroad leading inland to San Pedro Sula, one of the most important towns in the country), Tela, La Ceiba, Trujillo, and Omoa. On the south coast Honduras has only a small coast line on the Gulf of Fonseca, with a port on Tiger Island called Amapala. This constitutes the chief port for the capital, Tegucigalpa, goods and passengers being carried across the gulf to the small port of San Lorenzo, and thence by automobile and oxcarts over the fine national highway to the capital, a distance of 80 miles.

CONTROL AND ORGANISATION.

The first wireless station was installed during 1912 at the port of La Ceiba by the Vaccaro Brothers Railroad and S.S. Company.

There are other stations at Cuyamel, Tela, and Trujillo.

All these stations belong to private companies, and are without any co-ordination, being used only by the various companies to maintain communication with their own steamers. Under favourable atmospheric conditions they can work with New Orleans, but ordinarily they communicate with the Isla del Cisne (Swan Island), in the Caribbean Sea. They are more or less of the type of that at Tela, which has a transmitter of 5 kw., and aerials sustained by towers 250 feet high.



The Government has recently ordered a course of wireless to be included in the studies of the Military School at Tegucigalpa, and has installed a teaching set. There are no manufacturing plants in the Republic.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address*
Excmo. Señor don Jesus M. Alvarado	Secretario de Estado en el Despacho de Fomento, Obras Públicas y Agricultura	Tegucigalpa
Licenciado don Antonio Castillo Vega	Sub-Secretario de Estado en el Despacho de Fomento, Obras Públicas y Agricultura	Tegucigalpa

ADMINISTRATION.

According to the Law of Telegraphs of the Republic, this branch of Telegraphy is the exclusive right of the State, but this right has been made over to private companies on the north coast, in the form of concessions.

A Decree of July 16th, 1920, declares for the necessity of providing a modern and effective service of communication in order to aid international and domestic official relations and to provide a news service for the National Press, on commerce, industry, and social relations generally.

To this end the sum of two hundred and fifty thousand colones has been

voted for the purchase and installation of a radiotelegraphic and radiotelephonic station, situated preferably at the capital of the Republic, of sufficient power to communicate with places where radiotelegraph, radiotelephone, cablegraph or telegraph stations may be open for public service. Also from this same sum a number of smaller stations in the scattered regions of the National territory and preferably in the Cantons of Osa, Puntarenas, Liberia, and Sixaola are to be provided.

The following are the conditions under which private companies are granted concessions to instal and work radiotelegraphic and radiotelephonic apparatus :—

"The concessionaire has the right to construct, maintain, and use, in order to direct the service of his steamships, and those contracted by him, wireless stations ; these cannot be placed in public service without previous arrangement with the Government. Said Government shall have the right, in times of peace or of war, to use such installations, without remuneration for the concessionaire, and even to direct and control, exclusively, the service of same, by its own employees."

These concessions granted by the Government were approved by Congress.

Legislation relating to wireless telegraphy and telephony is up to the present contained in the following Decree :—

A.—Decree No. 34 Licenses.

EXECUTIVE POWER.

No. 34.

FRANCISCO AGUILAR BARQUERO,

Provisional President of the Republic of Costa Rica.

DECREES :—

ARTICLE 1.—Wireless telegraphy and wireless telephony which are services of public utility are declared to be State monopolies. The concession and right to exploit them can only be obtained for a limited time and by means of a contract, which to be valid must have the approval of the Legislative Power.

ARTICLE 2.—There can be no question of a concession regarding the perpetual right reserved to the State for the establishment of radiographic stations in the Republican territory for military purposes and for transmitting and receiving official messages.

ARTICLE 3.—The Executive Power may in accordance with the Regulations which it may prescribe authorise amateur and training Institutes to instal radiographic apparatus for experimenting, provided they do not violate the secrecy of correspondence of other wireless communications, nor disturb their working, nor use their apparatus for commercial purposes.

ARTICLE 4.—The establishment, management, and exploitation of wireless telegraph and wireless telephone enterprises for international service can only be permitted to those of Costa Rican origin, individually or in a body, under the supervision and protection of the State. A concession so obtained both the capital and enterprise devoted to it shall be unrestricted and may not be transferred in any case or for any reason without the previous consent of the Constitutional Congress.

ARTICLE 5.—Licenses granted for installations at present established in the country may be revoked at any time and the plants thereof taken over by the State, by a corresponding indemnity beforehand.

Given at the Presidential House, San José, on the tenth day of April, nineteen hundred and twenty.

FRANCISCO AGUILAR BARQUERO.

The Secretary of State for Foreign Affairs,
ANDRES VENEGAS.

The Secretary of State for Home Affairs and Police,
CARLOS M. JIMENEZ.

The Secretary of State for Finance and Commerce,
CARLOS BRENES.

The Secretary of State and Public Works.
P. PEREZ ZELEDON.

The Secretary of State for Public Instruction,
J. GARCIA MONGE.

The Secretary of State for the War Office and Admiralty,
AQUILES BONILLA G.

This Decree was ratified on July 16th, 1920, by the Constitutional Congress.

HONG-KONG

(See CHINA, FOREIGN SETTLEMENTS.)

HUNGARY

HUNGARY was founded in the ninth century by the Magyars. Constitutionally speaking the method of government has always been monarchical. By the Convention of 1723 (*Pragmatica Sanctio*) Hungary and Austria together formed a single territory as far as the dynasty was concerned, and in consequence for purposes of defence. According to the

Convention of 1867 the Commonalty was further developed because the Austro-Hungarian Monarchy possessed a common Administration as far as the Army and Foreign Affairs were concerned. The war, however, changed all this, and as a result Hungary acquired her entire independence. The form of government remains in principle monarchical.

CONTROL.

Radiotelegraphy is at present controlled by the Director-General of Posts and Telegraphs who is responsible for the promulgation of all laws and regulations relative thereto.

Official Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
Mons. Charles Demény	Secretary of State and Director-General of Posts and Telegraphs	Budapest

ORGANISATION.

A large station, with a range of 3,000 km., situated at Csepel, near Budapest, was established on November 18th, 1914, and during the year 1921 was equipped with a 5 kw. valve C.W. transmission set. Traffic can now be sent either by this or the old quenched spark equipment.

Considerable radiotelegraphic and telephonic developments are in course of preparation. Wireless apparatus has been installed in many of the schools throughout the country. No stations exist for aviation or meteorological purposes.

ADMINISTRATION.

A law concerning aviation in connection with radiotelegraphy is in course



of preparation, but detailed particulars are not yet available. No arrangements are contemplated regarding Time and Weather Signals.

Radiotelegraphy is governed by the following law, the text of which is printed below :—

A—Decree No. 62574/13, dated October 16th, 1913.
B—Form of Ship License thereunder.
C—Form of Certificate for Ship Stations.
D—Form of Certificate for Operators.

DECREE OF THE HUNGARIAN MINISTER OF COMMERCE WITH REFERENCE TO THE FITTING UP OF WIRELESS STATIONS ON HUNGARIAN SEA-GOING PASSENGER SHIPS.

A In accordance with paragraphs 24 and 27 of the Supplement to my Order No. 60,805, issued on August 21st of the current year, in the matter of authorising the placing of service of commercial sea-going ships, the safety appliances provided on them and the provision of the navigation service in connection with working them, passenger liners already in service, which make regular voyages from Hungarian ports to points beyond Gibraltar or Aden and are carrying passengers, are to be fitted with wireless apparatus of the description specified below not later than by February 1st, 1915; new ships, on the other hand, must be fitted with such apparatus before they are put into service. Such apparatus must be sufficiently powerful to be able to send or receive messages under ordinary conditions over a minimum distance of 100 sea miles.

In order to carry out this decree I order the following :—

1. The owner (or charterer) is obliged to apply to the Hungarian Minister of Commerce for permission to establish a wireless station on board.

Such application must be accompanied in quadruplicate by a technical description of the apparatus to be used, with a diagram of the connections. Any subsequent alteration in the syatem, or remodelling of any description of the apparatus, which may affect its capacity for sending or receiving messages, must receive the preliminary authorisation of the Hungarian Minister of Commerce.

2. The arrangement of the wireless station on the ship must be up to date and comply with Rule 3 of the London International Wireless Agreement, so that the station may be able to work in harmony with the working of wireless stations using other systems and be able to exchange messages with such other stations. The system to be adopted and to be used will depend on the preliminary authorisation of the Hungarian Minister of Commerce.

The apparatus must be of such a type that it can be adjusted for waves 300 and 600 metres long and with these be able to send or receive 20 words at least per minute, counting five letters to the word.

In the case of applying subsections 2a to 2d of paragraph xxxv of the London International Wireless Service Regulations, the apparatus on the ship will be allowed to make use also of wavelengths of 1,800 metres.

3. All the machinery and materials for fitting up the wireless station on the ship must be acquired in the home country as far as possible.

Machinery and materials to be used for such purpose may only be acquired from abroad with the special permission of the Hungarian Minister of Commerce. Service books and similar other stores and office requisites for the working of the wireless service will be supplied at cost price by the Chief Post and Telegraph Administration.

4. All ships fitted either for continuous or restricted wireless service, must in addition to the usual apparatus be fitted also with apparatus for sending out wireless distress signals in conformity with Rule xi of the London Wireless Service Regualtions as ordered by and in a manner fixed by the Hungarian Minister of Commerce.

Such apparatus for sending out wireless distress signals must be provided with its own separate power supply independently of any other power supply not used for the wireless service on board and must be of a design that it can be put in action expeditiously and be kept at work continuously for at east six hours and at the same time be powerful enough to send signals over a distance of at least 80 sea miles, on ships having a continuous wireless service and over at least 50 miles on ships with restricted wireless service.

This special installation for sending out distress signals may be omitted on all ships on which the regular wireless installation is able to fulfil these requirements.

5. The speed at which signals can be sent and received will be set out by the Hungarian Minister of Commerce in the document granting permission to establish a wireless service on a ship.

As regards new inventions for materially improving the efficient working of the apparatus and the speed of sending and receiving messages, the Hungarian Minister of Commerce may compel the owner (or charterer) of the ship to adopt such invention or inventions within a fixed period for the wireless station on his ship with due regard to existing practical requirements and a fair consideration of the expenditure incurred in connection therewith.

6. Under ordinary conditions the electrical power for working the wireless apparatus may not exceed one kilowatt, A greater power than this may only be used if the nearest station on the coast with which it is desired to exchange messages is situated at a greater distance than 200 sea miles or if on account of obstacles extant it is necessary to use the larger power (London Wireless Service Regulations, Rule viii).

7. The Chief Post and Telegraph Administration is empowered to have the wireless installation examined by its own inspectors at any period and to control the service.

The owner (or charterer) of the ship is obliged to afford to the inspectors of the Chiet Post and Telegraph Administration, and with the intervention of this Administration to officers appointed by the Navy every facility

to make themselves thoroughly familiar with the working in every detail of the wireless apparatus and gear and to acquire the necessary practice in working the apparatus.

Any stipulation on the part of the supplier of the apparatus that certain parts or details of the apparatus are to be kept secret and not to be shown to the inspectors of the Chief Post and Telegraph Administration or to officers of the Navy must not be accepted by the owner (or charterer) of the ship.

All inspectors and naval officers deputed to control or learn the working of the apparatus must be carried on the ship cost free by the owner (or charterer) of the ship in a class corresponding to their rank (with cabin accommodation in accordance therewith also free) and to charge them for their board at cost price.

Not more than two such persons, however, may travel on these conditions on the same voyage.

8. The nature of the service of the wireless station on the ship (whether public or special service, etc.), and its duration (whether continuous, restricted or service without special fixed hours), also the number and qualification (1st class or 2nd class) of the wireless operators, will be set out by the Hungarian Minister of Commerce in the document granting permission for the installation.

9. The Hungarian Minister of Commerce reserves himself the right to suspend at any time the wireless service on the ship for an indefinite period or permanently or in respect of certain special classes of messages without divulging his reason for so doing or without rendering himself liable to the payment of an indemnity.

In the case of an order for mobilisation in the Hungarian Monarchy being issued or in the case of war the wireless service on the ship is to be suspended altogether unless the captain of the ship receives special instructions to the contrary from the Chief Post and Telegraph Administration.

The captain of the ship will be held personally responsible for the carrying out of this regulation.

In other respects in time of mobilisation or war the owner (or charterer) of the ship is bound to carry out the special orders to be issued for the occasion.

10. Wireless operators to be employed may only be Hungarian citizens with a blameless record who can speak and write the Magyar language thoroughly and have obtained a certificate of qualification as regards wireless operating from the examining committee appointed by the Hungarian Minister of Commerce for the purpose.

The individuals thus qualified are to take the oath of loyalty in the presence of the examining committee, such oath to include promises to attend to their duty and to keep all messages secret, the fact of their having taken the oath being recorded on their certificate of qualification.

The wireless operators on board are subject to the discipline on the ship, must each possess their service books, and are to be placed on the list of the crew.

The owner (or charterer) of the ship is only allowed to have such individuals trained for the wireless service who have been chosen by the Hungarian Chief Post and Telegraph Administration for such purpose from a preliminary list of candidates submitted to the Administration.

Every wireless operator whose certificate is cancelled by the Hungarian Post and Telegraph Administration is to be dismissed immediately.

The owner (or charterer) of the ship is bound to give immediate notice of any change in the personnel of wireless operators to the Chief Post and Telegraph Administration and to the Hungarian Naval Authorities.

11. Every wireless station established for public service may be used by the public for sending wireless messages against payment of the proper fees.

The tariff of fees for wireless messages is fixed by the Hungarian Minister of Commerce on the recommendation of the Company. These fees are retained by the owner of the wireless station on board.

12. Out of these fees received by the owner (or charterer) of the ship for wireless messages he is responsible for the portions due to the inland and foreign telegraph authorities for forwarding messages.

In administrative matters the owner (or charterer) of the ship, or the wireless station on board, may only communicate with foreign telegraph administrations or with the International Bureau at Berne of the Telegraph Association through the Hungarian Chief Post and Telegraph Administration.

13. In conformity with Rule 3 of the London Wireless Agreement the wireless station on board is bound to enter into communication with every wireless station ashore or established on any ships regardless of the system used by such stations for the purpose of exchanging messages, and in accordance with Rule 9 the wireless station on board is compelled to accept distress signals from any source whatever, to reply to these and to take the necessary steps.

Wireless stations established on ships are to pay particular attention to the working of stations on the coast. The wireless station on board is to be kept in perpetual and efficient working order in order to be able to keep up faultless communication with the coastal stations.

At the request of the coastal station the wireless station on board is bound to stop its message immediately.

14. The working of the wireless station on board and the accounting for the fees received by such station are to be governed by the London Wireless Agreement and the service regulations attached thereto, by the St. Petersburg Telegraph Agreement and the service regulations attached thereto, and also by any orders already issued or to be issued by the Hungarian Chief Post and Telegraph Administration.

The wireless station, or the shipowner (or charterer) respectively, is bound to conform with the legal enactments and orders issued with reference to matters relating to the telegraph, telephone and electric signals.

During a stay in foreign ports the wireless station on board is bound to conform with any special rules which may be in force in the country of its sojourn besides those prescribed by the International Wireless Agreement and the regulations attached thereto.

It is the duty of the shipowner (or charterer) to make himself acquainted with these.

15. As an acknowledgment of the sovereignty of the State and in order to defray expenses incurred in the ordinary control of the wireless station on board, the owner (or charterer) of

the ship is bound to pay on the dates named, and at the receiving offices named in the document granting permission for the establishment of the wireless station, twenty (20) crowns per station per annum.

Should it become necessary to institute an inquiry owing to any neglect or fault on the part of the owner (or charterer) of the ship or one of his employees and should the enquiry establish any neglect or fault on the part of the owner (or charterer) or one of his employees, the owner (or charterer) will be bound to indemnify the Treasury for all expenses incurred in connection with such enquiry.

16. In every case of neglect or fault in or about the wireless service the Hungarian Chief Post and Telegraph Administration may mulct the owner (or charterer) of the ship in a penalty not exceeding 100 crowns providing such acts of neglect or fault do not constitute a misdemeanour or crime.

17. If after repeated warnings the wireless station on board should not do its duty, or if the working of the station should militate against public interests, the Hungarian Minister of Commerce is empowered to inflict a heavier penalty of 100 to 1,000 crowns or to issue orders to have the working of the wireless station entrusted to an individual appointed by the Minister at the expense and responsibility of the shipping undertaking, and at the same time the Minister is to have power to have all faults made good in the apparatus and have all the necessary alterations made in the apparatus at the expense of the owner (or charterer) of the ship, or as an alternative to suspend or cancel the permit for the wireless station on board.

18. The permit for the establishment and working of a wireless station on board cannot be granted for a period exceeding 20 years.

At the expiration of the period mentioned in the document granting permission the whole installation with all its accessories (including furniture and fittings) and eventually also the installation for sending out distress signals are to be handed over to the Hungarian Post Office in full efficient and faultless working condition free of charge and without liability.

Should the Hungarian Post Office not wish to take charge of the working of such wireless station thus come into their possession, but to leave it further in the hands of the owner (or charterer) of the ship, the owner (or charterer) is bound to pay twenty (20) crowns per annum over and above the fee mentioned in Clause 15 in acknowledgment of the right of ownership of the installation thus acquired by the State.

A permit given for the establishment of a wireless station on a ship is automatically cancelled by the putting out of commission of the ship and the owner (or charterer) of the ship is obliged to give notice of this to the Hungarian Chief Post and Telegraph Administration. Should it be desired to transfer the wireless installation to another ship a fresh permit for so doing will be required.

19. Moreover, the Hungarian Minister of Commerce has full power to cancel temporarily or permanently the permit for the working of a wireless station at any time even before the expiry of the period for which such permit has been granted and to cancel it without assigning any reason for his decision and to take over the working of the installation or to have it dismantled.

In the case of the working of the installation being taken over temporarily by the Ministry, the owner (or charterer) of the ship is bound to hand over for use free of charge and without any indemnity the whole of the installation with all the apparatus, fittings and stores for working same, also the cabin and locality in which the installation is housed, together with the sleeping cabins of the wireless operators; also to supply free of cost the power required for working the installation and supply the food, render all medical service and provide attendance and other necessities required by the operators. As against this, however, all fees paid for wireless messages will be handed over to the owner (or charterer) of the ship.

The terms of the final taking over of the installation are or will be specified in the permit or in the special order issued for the purpose.

Before the installation is taken over finally under the ordinary conditions six months' previous notice will be given, but the Hungarian Minister of Commerce reserves himself the right to shorten this period if public interests should necessitate this step or even to take over the installation at any time without any previous notice whatever.

20. Should, in the unchallengable opinion of the Hungarian Minister of Commerce, public interests require it, the Hugarian Chief Post and Telegraph Administration may—through the courts of law and without incurring any liability in respect of claims for indemnity—issue orders for any vessel being fitted with wireless installation at the expense of the Treasury to have the service maintained and to have the installation dismantled when its use is no longer required by public interests and to arrange for certain compensation being arranged in connection therewith to the owner (or charterer) of the vessel.

21. The Hungarian Minister of Commerce reserves himself the right to grant exemptions from the above regulations from case to case in conformity with practical requirements.

Hungarian Minister of Commerce.
N. . . . .
V. 191.

LICENSE.

B Sec. 1.—The Minister grants a license to
to instal a public wireless service station on his ship named
carrying passengers and to work such station during the period while the license remains in force under the conditions specified below.

Sec. 2.—The person to whom the license is granted is obliged to comply with the following:—

(*a*) With the provisions contained in Section XXXI of the Law of 1888 and with Decree No. 23445 issued in July 1890 for carrying out this law, as well as with Decree No. 62574 issued on October 16th, 1913, for establishing wireless stations on Hungarian passenger ships.

(*b*) With the provisions of any law to be enacted in future as well as of any ministerial decree or order already issued or to be issued in future by the Hungarian Post Office with the same object in view.

(*c*) With the orders contained in the International Wireless Agreement and its service regulations.

(*d*) With the conditions laid down in the present license.

Sec. 3.—The grantee is obliged to establish

the installation on board in accordance with the "Telefunken" system in a manner complying in every respect with the requirements laid down in the Wireless Service Regulations, Rule III, sub-sections 1 and 2, Rule VII, sub-section 2 and Rule VIII.

The normal distance over which the installation is to be able to exchange messages is to be at least 200 sea miles by day and at least 300 miles by night.

The normal wavelength of the installation is fixed by the Minister at 600 metres with the reservation laid down in Rules III and XXXV of the International Wireless Service Regulations.

Sec. 4.—The holder of this license is obliged to instal besides the ordinary service installation on board an auxiliary installation in conformity with Rule XI of the International Wireless Service Regulations.

Sec. 5.—The holder of this license undertakes to maintain permanently the two installations mentioned in sections 3 and 4 in good serviceable working condition and to introduce all improvements in accordance with the progress made by the science of wireless telegraphy.

The Minister reserves himself the right to compel the holder of this licence to adopt all new inventions of wireless practice materially enhancing the reliability and speed of exchanging messages.

All machinery, apparatus and materials to be used in fitting up the installation on board are to be obtained inland as far as possible.

Machinery, materials and apparatus of this kind may only be obtained from abroad with the special sanction of the Hungarian Minister of Commerce.

Sec. 6—The holder of this license has no right to alter the system of the wireless installation on board mentioned in Section 3. Generally speaking the Minister's preliminary consent must be obtained for any alteration whatever in the installation as described in the technical description or in the diagram of connections both forming a complementary part of the present license.

Sec. 7.—The holder of this license and his employee in handling the wireless apparatus and maintaining the wireless service must act in conformity with the International Wireless Agreement and the Service Regulations attached thereto with the rate of telegraph fees and also with parts I and II of the telegraph service rules and orders issued by the Chief Post and Telegraph Administration.

Sec. 8.—The Minister fixes the call signal of the station in the H A B group of letters, its character is to be a "P G station for public correspondence" in conformity with sub-section 4 of Rule V of the Wireless Service Regulations. As regards hours of service the wireless station is to be classed in the second category—*i.e.*, stations with restricted hours of service in accordance with the provisions of Rule XIII, sub-section 3 of the Wireless Service Regulations.

The official hours are to be from 8 a.m. to 8 p.m.

In accordance with Rule XIII sub-section 3 of the International Wireless Service Regulations—during the periods of sailing over and above the official hours named—operators must be at their posts ready to receive messages and stay there permanently during the first ten minutes of every hour.

Sec. 9.—In conformity with the office hours fixed in section 8 the holder of this license undertakes to employ at least one first-class operator for attending to the service of the wireless station on board in accordance with Rule X sub-section 2 and the Wireless Service Regulations.

Sec. 10.—This operator, like all other wireless employees, must be a Hungarian citizen of blameless character who is able to write and speak the Magyar language perfectly and is the holder of a certificate of qualification for wireless operating from an examining body appointed for the purpose by the Hungarian Minister of Commerce.

The qualified individuals must take the oath of loyalty in the presence of the examining body, such oath to include promises of due attendances to their duties and to keep all messages secret, the fact of having taken this oath is to be testified in their certificate of qualification.

The employees in the service of the wireless station on board are subject to the discipline of the ship, they must be provided with service books of the ship and enrolled on the register of the crew.

As regards the wireless service these employees are subject also to the Chief Post and Telegraph Administration and must comply with the directions issued for the proper performance of the service.

The owner (charterer) of the ship may only train such individuals for the wireless service whose training is permitted by the Hungarian Chief Post and Telegraph Administration after preliminary notice of such intended training has been given to the Administration.

Every wireless employee whose certificate is withdrawn by the Hungarian Chief Post and Telegraph Administration must be dismissed immediately.

The owner (or charterer) of the ship must give immediate notice of any change in the personnel of the wireless staff to the Chief Post and Telegraph Administration and also to the Hungarian Naval Authorities.

In accordance with Rule X sub-section 4 of the Wireless Service Regulations "the service of the wireless station on board is under the chief supervision of the captain of the ship." Hence the holder of this license must order the captain of the ship to take the oath of loyalty and for the preservation of the secret of messages, before a representative of the Hungarian Post Office.

Sec. 11.—The wireless station is intended for public correspondence and may therefore be used by anybody for sending messages against payment of the prescribed fees and observance of the rules laid down for the telegraph service.

On the other hand, in accordance with Rule 3 of the International Wireless Agreement the wireless station on board must exchange wireless messages with any and every other such station on shore or afloat—irrespective of the system used by such stations for receiving or sending wireless messages.

The operators of the wireless station on board must refuse to accept any message which, if transmitted to any part of the territory of Hungary, may endanger the safety of the Hungarian State, or the contents of which may form a breach of the country's laws or offend against public order or morality.

Should the person handing in the message still insist on its transmission the captain of the ship is to be appealed to, whose decision in this matter is to be considered final.

SEC. 12.—The fee for transmitting a wireless message from the ship is fixed at 40 fillérs per rateable word with a minimum fee of 4 crowns per message.

The Minister, however, reserves himself the right to modify this rate of fees at any time even during the duration of this license or to fix a new tariff for messages sent.

SEC. 13.—The fees referred to in the previous section may be retained by the holder of this license.

Messages which at telegraph stations of the State are accepted for free transmission or are transmitted on the credit system must be accepted and transmitted by the holder of this license on the same terms.

SEC. 14.—In dealing with telegrams and preparing accounts the wireless station on board must only use dating stamps, printed forms and books that are prescribed for use and are issued for this purpose by the Hungarian Post who will supply them to the holder of this license at cost price on his written application to the Chief Post and Telegraph Administration.

The holder of this license is obliged under all circumstances to keep within easy reach a copy of each of the following service books for the use of the wireless station staff on board —the International Telegraph Agreement with the Service Regulations pertaining thereto, the International Wireless Agreement with the Service Regulations pertaining thereto, the Nomenclature Officielle des Bureaux Télégraphiques, the Nomenclature Officielle des Stations Radiotélégraphiques, the Liste Alphabétique des Indicatifs d'Appel, the book of telegraph rates and Parts I and II of the Telegraph Service Regulations, the book of telegraph fees issued for Hungarian wireless stations on ships, and also a copy of the Post and Telegraph Instructions. The holder of this license must also take care that all these books are corrected and kept up to date by the wireless staff in conformity with the additions and corrections periodically issued by the International Telegraph Bureau and in the collection of Postal and Telegraph Regulations.

SEC. 15.—The holder of this license is fully responsible financially for all claims of every kind raised on any legitimate grounds against the Hungarian Post Office by anybody for the return of fees paid or indemnification in cases arising from the service of the wireless station on board his ship.

The holder of this license is fully responsible financially for all telegraph fees of every kind payable under International agreements in accordance with telegraph tariffs arising from the telegraph service of the wireless station on his ship.

These fees—at the financial responsibility of the holder of this license—are collected in cash by the staff of the wireless station on his ship who are bound to keep and render correct accounts and also supply a list of all the wireless messages received, sent or relayed by the station. The Chief Post and Telegraph Administration issues proper forms for making out such accounts and lists with the necessary instructions for dealing with these forms.

The holder of this license or the manager of the wireless station in his place—in accordance with Rule XL of the International Wireless Service Regulations—must once a month or in any case within eight days of the ship's return to port from every voyage send at the expense of the holder of this license to the Section III of the Adult Department of the Ministry of Commerce the following papers and documents carefully arranged and packed: the originals of all wireless messages, all records of messages transmitted all receipts for delivery of wireless messages received and all documents and accounts in connection therewith.

Prior to this, however, the holder of this license or the manager of the wireless station in his place must prepare an account of all fees received in connection with the working of the wireless station on board and after deducting the fees due to the holder of this license or to the wireless station on board he must pay in the remaining balance at the Hungarian Post and Telegraph Office No. 1 duly receipting on the account the sum retained by the station on the ship of the holder of this license.

The holder of this license or the manager of the wireless station on board respectively may only communicate with foreign telegraph authorities or with the International Bureau of the Telegraph Association at Bern through the medium of the Hungarian Chief Post and Telegraph Administration.

SEC. 16.—In home ports the wireless station may not transmit telegrams unless specially authorised to do so by the Chief Post and Telegraph Administration.

When visiting foreign parts, any special regulations in force in the country of sojourn must also be respected in addition to the regulations of the International Wireless Agreement and the Service Rules prescribed therein.

It is the duty of the owner (or charterer) to make himself acquainted with these.

SEC. 17.—The Hungarian Chief Post and Telegraph Administration may at any time have the wireless station examined by their inspectors and its service checked.

The owner (or charterer) of the ship undertakes to afford means to the inspectors of the Hungarian Chief Post and Telegraph Administration, as well as to officers of the Navy, through the mediation of the Hungarian Chief Post and Telegraph Administration to make themselves thoroughly acquainted in every detail with the handling of the wireless apparatus and to acquire the necessary practice therein.

The owner (or charterer) of the ship must not consent to any stipulation on the part of the supplier of the wireless apparatus that the arrangement of the apparatus or any part thereof should be kept secret and not be shown to the inspectors of the Hungarian Post and Telegraph Administration or to the officers of the Navy.

The owner (or charterer) of the ship undertakes to carry the inspectors and naval officers thus appointed for the study of the apparatus and training in its manipulation free of charge in a class of the ship corresponding to their rank, also to find them, free of charge, cabin accommodation and to make it possible for them to pay for their board at cost price.

Two such persons, however, may only travel on the ship on the same voyage.

SEC. 18.—As an acknowledgment of the right reserved to the State and to defray the costs incurred in the regular control of the wireless station on board, the holder of this license undertakes to pay the sum of twenty (20) crowns to the Post and Telegraph Office No. 1 within the first half of January every year.

Should an enquiry become necessary owing to any alleged neglect or fault on the part of the owner (or charterer) of the ship or one of his

employees, and should such enquiry prove that the holder of this license or his employee is at fault, the holder of this license would be obliged to refund to the Treasury the whole of the costs arising from such enquiry.

SEC. 19.—The Hungarian Chief Post and Telegraph Administration has the power to mulct the holder of this license in a penalty not exceeding 100 crowns for any neglect or fault in the wireless service provided such omission or commission does not form an act of misdemeanour or a crime. If the wireless station on board should not attend to its duties after repeated warnings, or should the service of the station clash with the public nterests, the Hungarian Minister of Commerce shall have the power to inflict eventually a higher penalty of from 100 to 1,000 crowns or to make arrangements to have the wireless service of the station performed by a delegate of the Minister specially appointed for the purpose at the expense and responsibility of the shipping undertaking, and to have any apparent shortcomings in the arrangement of the wireless apparatus put right and any required alterations made at the expense of the holder of this license, or as an alternative the Minister may suspend or cancel the license for the working of the wireless apparatus.

SEC. 20.—The period during which the present license will remain in force is ten (10) consecutive years counting from the date of the license.

Should the holder of this license not insta the wireless apparatus within a year counted from the date of the present permit, this permit will be cancelled and the holder of the license will have to return it for cancellation to the Minister.

SEC. 21.—In accordance with the provisions of Section XXI subsection 3 of the Law of 1888 and in conformity with the decree issued by the Minister of Commerce under No. 62574/1913 in the matter of establishing wireless stations on sea-going passenger ships, the whole of the wireless installation with all its accessories (including furniture, fittings), as well as the installation for sending out distress signals, is to be handed over to the Hungarian Post Office in perfect working order free of cost and without any claims at the expiry of the period specified in the present license.

Should the Hungarian Post not wish to undertake themselves the service of the station thus handed over to them but to leave its further working in the hands of the holder of this license, the owner (or charterer) of the ship undertakes to make an annual payment of twenty (20) crowns in acknowledgment of the proprietary right over the installation thus acquired by the State over and above the payment specified in section 15 payment of both sums to be made simultaneously.

Should a ship be put out of commission the license for the maintenance and working of the wireless station thereon becomes null and void and the holder of this license shall give the Hungarian Chief Post and Telegraph Administration due notice of the fact. Should it be desired to transfer the wireless installation and re-erect it on another ship, this can only be effected under a new license.

SEC. 22.—The Minister reserves himself the right to take possession temporarily or permanently, on behalf of the State, of the wireless station at any time even before the expiry of the present license without giving any explanation whatever for taking such a step.

Should the installation be taken over temporarily the holder of this license undertakes to hand over for use free of charge the whole of the apparatus with all accessories, fittings and stores for working it as well as the office wherein it is housed and the cabins for the accommodation of the operators without any claim for indemnity, also to supply free of charge the power required for working the installation, also to provide free of charge all necessaries (board, medical assistance and servants, etc.) required by the operators. As against all these services all fees collected for wireless messages are to be handed over in this instance also to the holder of this licence.

Under normal conditions six months' previous notice will be given if the installation is to be taken over permanently, but the Hungarian Minister of Commerce reserves himself the right to shorten the period of this notice or to take possession of the station at any time without any notice at all, should public interest call for such a step.

Should the working of the installation be taken over by the State permanently before the expiry of this license, the Hungarian Post Office will indemnify the holder of this license for the technical parts of the wireless apparatus by paying him the cost as per invoices or other evidence to be produced by him less ten (10) per cent. for every year during which the installation has been in use. The balance thus remaining will be paid to him by the Post and Telegraph Administration at Budapest.

Beyond this indemnity to be paid to him the holder of the license shall not be able to sue in any court for any claim for loss of profit or for the payment of any other indemnity under any other pretext whatever.

SEC. 23.—The Minister reserves himself the right to suspend at any time the service of the wireless station for an indefinite period, or permanently, or for messages of a certain kind without having to assign any reason for such an order and without incurring any liability for damages caused by the suspension.

In case of an order being issued for mobilisation in Hungary, and in time of war, the wireless station on board is to be closed down altogether unless the captain receives instructions to the contrary from the Hungarian Chief Post and Telegraph Administration.

The captain will be held personally respon sible for the compliance with this direction.

In other respects the holder of this license will have to carry out all special orders to be issued in times of an eventual mobilisation or war.

SEC. 24.—This license may only be transferred to another person with the Minister's special consent to be applied for in advance.

SEC. 25.—Should any difference of opinion arise between the State and the holder of this license as to the correct interpretation of any of the stipulations of the present license the matter or matters at issue shall not be referred to any Court of Justice but shall be settled by the Minister of Commerce in the usual official way, adopted by the Public Administration.

SEC. 26.—Every copy of the present license issued officially is subject to a fixed stamp duty amounting to two crowns.

Budapest, 19 .

By the Order of the Minister,
Chief Director of Posts and Telegraphs.

CERTIFICATE.

C For the ship station on board the Hungarian vessel ....

The general administration of Posts and Telegraphs of Hungary attests that the ship station on board the Hungarian vessel ....was installed on the basis of the license of the Hungarian Government and that the installation of the ship station complies with the conditions prescribed by the service regulations annexed to the International Radiotelegraph Convention.'

The ship station is classed in the.......... category from the point of view of its obligations as to hours of service.

Normal range in nautical miles:

Day ....

Night ....

Budapest, the..........

General Administration of Posts and Telegraphs of Hungary.

CERTIFICATE.

D The Commission, delegated by the Hungarian Minister of Commerce, has submitted Mr.................. born at...........................on the ....to an examination of the radiotelegraph service and tested his professional ability as regards:

(a) The adjustment of apparatus and knowledge of its working.

(b) The speed of—

Transmission

..........words per minute.

Reception by sound

..........words per minute.

(c) Knowledge of the regulations applicable to the exchange of radiotelegraph communications.

In testimony whereof the Ministry of Commerce of Hungary has, by virtue of Article X of the International Radiotelegraph Convention, issued this..........Class Certificate to Mr..................... who at the conclusion of the examination took the oath of secrecy of correspondence.

Made at........................... the

.........................19 .

ICELAND

ICELAND, known to the geographers of the ancient world as "Ultima Thule," lies in the North Atlantic Ocean between 63° 23′ and 66° 33′ north latitude, whilst its longitude extends from 13° 22′ to 24° 35′ W. Its area is estimated as 40,500 square miles, which means that it exceeds Ireland in point of size.

Colonised in the ninth century by Vikings from Norway, the inhabitants were converted to Christianity by Irish monks, and in 1000 A.D. that religion was formally acknowledged by the State.

Originally an aristocratic republic, as described in the pages of its illustrious historian, Snorre Sturlason, Iceland acknowledged the sovereignty of the King of Norway in the thirteenth century, and shared the union of the latter country with Denmark in 1388. On the partition of Europe in 1814, Denmark resigned Norway but retained Iceland.

On December 1st, 1918, an Act creating a Federal Constitution for Denmark and Iceland came into force, the two states remaining free and independent under the same sovereign. Its capital city is Reykjavik, with a population of about 13,000.

Iceland employs the metric system of weights and measures, whilst its coinage is the same as that of Denmark.

CONTROL.

The first wireless station erected in Iceland was designed and fitted for reception only, and was put up by the Marconi Company in 1905. It was shut down in 1908. The present installation at Reykjavik was erected by the same company for the Icelandic Government in the course of 1917-18, and was opened for public service on June 17th 1918.

Since 1919 the Government have erected four wireless telegraph and telephone coast stations, which have been put up by Icelandic technicians. All the Icelandic mail steamers and several trawlers are now fitted with Wireless Telegraphy.

All the coast stations and most of the ship stations are of the Marconi system.

The State has a monopoly in the erection and working of wireless stations, but private persons or companies may be permitted to do both under a license from the Telegraph Department.



OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
The Rt. Hon. Pétur Jonsson	Minister of Public Works	Reykjavik
Mr. O. Forberg	Director-General of Telegraphs	Reykjavik
Mr. Frb. Adalsteinsson	Superintendent of Wireless Station and School	Reykjavik

Amateur Stations.—Three, only one of which is able to transmit.

Wireless Socities.—There are none devoted solely to radiotelegraphy, but the *Technical Society of Iceland* (Secretary, Otto B. Arnar) gives considerable prominence to the subject.

ADMINISTRATION.

The following legislative enactments govern wireless in Iceland :—

A—Act of November 14, 1917.

B—Regulations under the above Act.

ACT OF NOVEMBER 14TH, 1917, CONCERNING THE WORKING OF WIRELESS TELEGRAPH STATIONS IN ICELAND.

I.

A The State has a monopoly in the erection and working of wireless stations on Icelandic soil and within the territorial waters of Iceland.

II.

Within the territorial waters of Iceland, the wireless stations of foreign ships may only be in use in conformity with regulations drawn up by the Ministry of Iceland. The Ministry can prohibit all wireless communication within the territorial waters of Iceland, and take such precautions as may be necessary to ensure the observance of this prohibition.

III.

On board of Icelandic ships which do not belong to the Government, whether they are within or without the territorial waters of Iceland, wireless stations may only be erected and worked with the permission of the Ministry. If the stipulations accompanying this permission as regards the equipment and working of the station are not complied with, the Ministry can withdraw it. Applications for permission to work wireless stations that are in operation when this Act comes into force must be sent to the Ministry not later than eight weeks from the date of this Act. The Ministry will then decide how their future working is to be carried on.

IV.

On Icelandic soil, and within the territorial waters of Iceland, wireless stations, or other means of wireless communication, can only be installed and worked with the consent of the Ministry, and in conformity with the stipulations made by it.

V.

The Regulations contained in the fifteenth paragraph of the Telegraph Act of October 20th, 1905, imposing secrecy upon those engaged in the telegraph service, are equally applicable to wireless operators. Paragraph 16 of the same Act, regarding the same obligation of those engaged in private telegraph service, is also valid as regards wireless telegraph operators on board of ships.

VI.

The violation of this law, or of the Regulations which the Ministry are hereby empowered to make, shall be punished with fines, or with imprisonment for a term not exceeding six months, provided the violation does not involve a more serious punishment. Further, all apparatus illegally installed or worked shall be confiscated. Lawsuits arising from violations of this law, or the corresponding Regulations of the Ministry, shall be tried in public police courts.

B WIRELESS TELEGRAPHY AND TELEPHONY REGULATIONS.

I.

In the present Regulations:

(*a*) *Wireless station* means apparatus or other means of conveying signals to a distant point without any intermediate conductor.

(*b*) *Wireless operator* means a person employed in the operating of all sorts of apparatus for wireless telecommunication.

(*c*) *Ministry* means the Ministry of Iceland.

(*d*) *Wireless apparatus* means apparatus used for transmission and reception of intelligence between distant points, without any intervening conductor.

1.—Erection of Wireless Stations.

II.

On Icelandic soil, or within the territorial waters of Iceland, or on ships registered in Iceland, a wireless station must not be erected or worked without a special permit of the Ministry, who will issue a license for such station. This license, or a certified copy of it, must always be kept at the station named therein. If the stipulations contained in this license are not complied with, it may be withdrawn and the station dismantled.

III.

Application for a license to erect and work a wireless station must be sent to the Director-General of Telegraphs.

The installation of wireless stations on board ships must comply with the stipulations of Paragraph VII of the International Regulations on Wireless Telegraphy.

A wireless station must not be opened for correspondence before the Director-General of Telegraphs has declared the equipment complies with the stipulations contained in the licence.

2.—Installation and Operation of Private Ship Stations.

IV.

The wireless apparatus of a ship station must always be maintained in strict accordance with the stipulations of the license.

V.

The Director-General of Telegraphs fixes the hours of service for each coast station.

Ship stations are, as regards hours of service, divided into three classes:

1. Stations permanently open.
2. Stations with limited hours of service.
3. Stations with no fixed hours of service.

During navigation a constant aural watch must be kept at stations of the first class. On stations of the second class watch must be kept during the hours of service, and also during the first ten minutes of each hour. At stations belonging to the third class no regular watch need be kept.

VI.

All ship stations must be so equipped as to permit both transmission and reception with 300 and 600 metre wavelengths; 600 metres is the normal wavelength of all ship stations.

An exception to this rule may be made in the case of samll vessels, where it is difficult to produce a wavelength of 600 metres, when permission may be given to use 300 metre wavelengths for transmission, but every station must be able to receive wavelengths of 600 metres.

First and second-class ship stations must be fitted with an auxiliary transmitting set provided with an independent power supply, able to work for at least six hours continuously. This set must be fixed in as safe a position as possible, and must have a minimum range of eighty miles for first-class stations and fifty miles for second-class stations.

On ships where the main installation is such as to fulfil the conditions laid down for the auxiliary set, the latter is not required.

VII.

Ship stations should be operated by either one or two wireless operators licensed by the Director-General of Telegraphs.

Wireless operators holding certificates issued by foreign administrations may be permitted to operate ship stations, but a seperate permit must be obtained for each voyage.

The certificate states:—

(*a*) That the holder understands the wireless apparatus and how to operate it.

(*b*) That the holder is able both to transmit and to receive Morse signals at a speed of not less than

(1) Twenty words a minute in the case of first-grade operators, and

(2) Twelve words a minute in the case of second-grade operators.

(*c*) That the holder possesses an adequate knowledge of the Regulations affecting wireless telegraphy.

Furthermore, the certificate contains the holder's pledge of secrecy, whereby he is subject to the same law as telegraph operators of the telegraph administration, and the same penalties for violation.

Second-grade wireless operators are permitted to operate ship stations which are only for the ship's own use or that of the crew. Furthermore, they are entitled to operate other stations having at least one first-grade operator.

First-class ship stations are bound to be operated by at least two first-grade wireless operators.

Wireless operator's certificates must always be kept in the wireless cabin, where they car be seen by the radio inspectors of the telegraph department.

VIII.

So far as it is possible all ship stations are bound to exchange traffic with other stations, without regard to the wireless telegraph system of the station concerned. The exchange of traffic between ships must be so arranged as to interfere as little as possible with that of the coast stations, which are generally given priority in public correspondence.

As a general rule, the working of every station must be so arranged as to cause the least possible disturbance in the traffic of other stations. All unnecessary transmission of signs or words is strictly forbidden. Experiments and tests are only permitted in so far as they do not interfere with other stations. In such cases as little transmitting energy as possible and none of the ordinary wavelengths should be used.

In an Icelandic port the wireless apparatus of a ship must not be made use of except in case of:—

(*a*) The ship being in distress.

(*b*) The ship being in communication with a ship in distress.

(*c*) The ship being in a port where there is no telegraph or telephone station.

(*d*) The ship being, from some reason or other, unable to communicate with the shore otherwise than by wireless.

As regards (*c*) and (*d*) the permission of the nearest shore station within the ship's range must be obtained.

IX.

Whenever it is considered necessary, the telegraph department arranges an inspection of each ship's station by persons appointed therefor by the Director-General of Telegraphs. All their orders and arrangements relating to the maintenance and operation of the wireless apparatus must be closely followed. Inspectors are required to supply the Director-General with a report of the inspection of each station.

3.—Handling of Radiotelegrams.

X.

All wireless stations, except those intended for a special limited correspondence (see Paragraph XI), are required to accept public correspondence.

Messages are divided into three classes :—

1. Government messages.
2. Service messages.
3. Public correspondence.

The handling of these messages on the land lines will be in accordance with the domestic and international regulations governing the telegraph service. The handling of radiotelegrams between wireless stations will be carried out in accordance with Paragraphs XIV-XV, XIX-XL, XLV-XLIX of the International Wireless Telegraph Regulations.

XI.

Ship stations may be utilised for :—

(*a*) General public correspondence.

(*b*) Limited public correspondence—*e.g.*, light ships, cable ships, etc.

(*c*) Private correspondence (with special ships and fishing companies).

In general public correspondence the following special radiotelegrams may be accepted :—

1. Telegrams with reply prepaid.
2. Telegrams to be collected.
3. Telegrams to be delivered by mail.
4. Telegrams to be delivered by express.
5. Telegrams with certificate of delivery. This certificate is only issued as regards delivery from the wire to the nearest wireless station.
6. Paid service messages.
7. Express telegrams. These are, however, only transmitted as such along the ordinary land lines.

All stations are bound to give precedence to inquiries from ships in distress.

Ship stations have no responsibility as regards the exchange of radiotelegrams.

Ship stations that are open for general public correspondence will, against payment, be supplied with all printed forms, journals, etc., by the telegraph department; these stations are bound to be governed by all instructions of the Director-General of Telegraphs, as regards operation of the apparatus and handling of the traffic.

XII.

The complete charge for a radiotelegram includes :—

1. The wireless charges :—

(*a*) The shore fees (belonging to the shore station).

(*b*) The ship fees (belonging to the ship station).

(*c*) The transit fees (belonging to an intermediate land or ship station that may be required to handle the message).

2. The wire charges.

The shore charges in this country shall be 40 cents a word, and not less than 4 frs. for each message.

The ship fees are fixed by the shipowner with the approval of the Director-General. They must not exceed 40 cents, and the minimum charges must not be more than that for a ten-words message. Service messages *re* wireless traffic, that has only passed between wireless stations, are not free of charge on the land lines. Press telegrams at half rate are not accepted.

XIII.

The entire charge for handling a radiotelegram from sender to addressee is to be charged to the sender. It is not permitted to charge more than stated in the tariff books.

XIV.

Every shipowner is liable for all charges collected on board his ships.

XV.

Each ship station is bound to send, once monthly, all original radiotelegrams, with relative vouchers, to the Director-General of Telegraphs.

XVI.

Reimbursement of charges, and accounts with the Telegraph Department, are to be governed by the Paragraphs XLI and XLIII of the International Radiotelegraph Service Regulations.

4.—Experimental and Amateur Stations.

XVII.

Those wishing to erect an experimental or amateur wireless station must send an application for permission therefor to the Director-General of Telegraphs.

The applicant must prove his ability to transmit and receive at not less than ten words a minute in the Continental Morse code, and that he possesses an elementary knowledge of the science of wireless telegraphy. The application must be accompanied by drawings, and an accurate specification of the station to be erected. Such stations will not be permitted to radiate waves of greater length than 200 metres.

In the event of a license being granted to such stations the licensee must sign a declaration of secrecy.

5.—Other Stipulations.

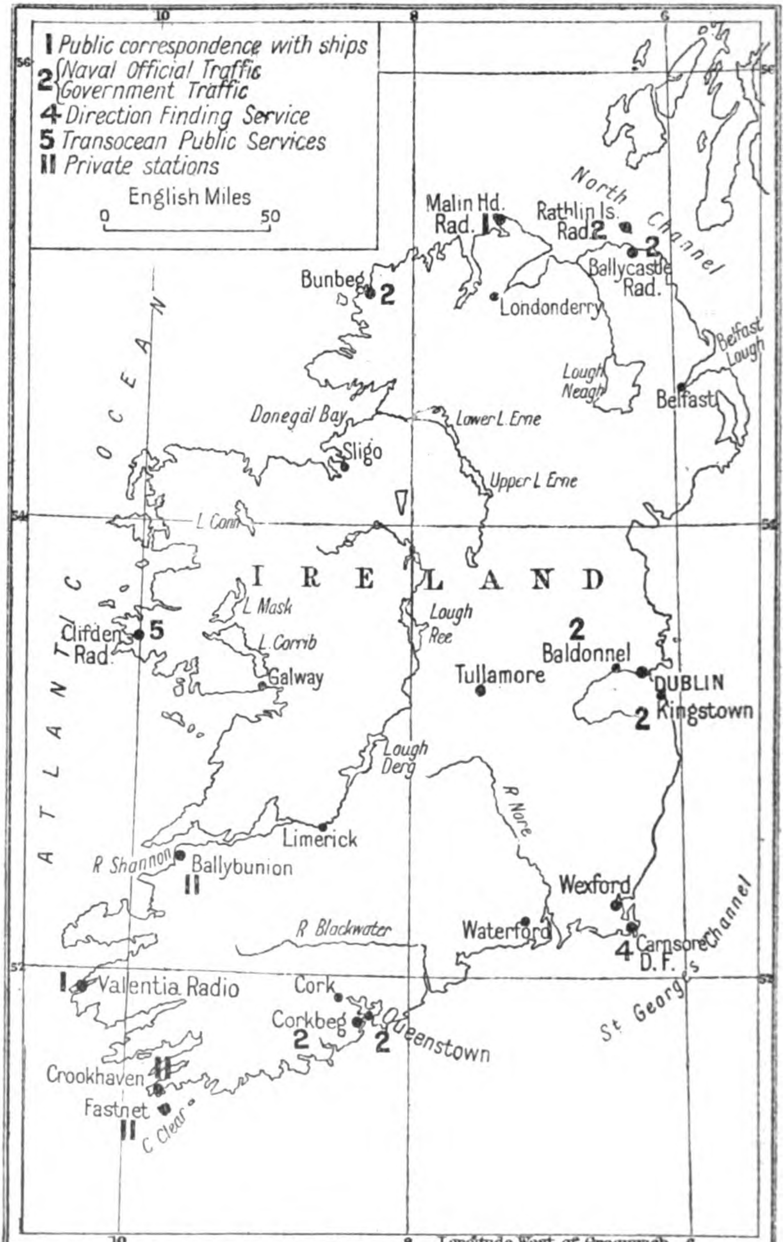
XVIII.

The stipulations of Paragraph VIII, *re* use of wireless apparatus in ports, are also valid as regards foreign vessels.

XIX.

The Ministry may prohibit all radiotelegraphic communication within the territorial waters of Iceland, by both Icelandic and foreign vessels, and may make the necessary arrangements to enforce this prohibition.

The Ministry can, furthermore, exercise a censorship over all such radiotelegraphic traffic, and stop any radiotelegram that is considered to be harmful to the safety of the State.


1 Public correspondence with ships
2 {Naval Official Traffic / Government Traffic
4 Direction Finding Service
5 Transocean Public Services
II Private stations
English Miles
0 50
ATLANTIC OCEAN
IRELAND
North Channel
Malin Hd. Rad. 1
Rathlin Is. Rad. 2
Ballycastle Rad. 2
Bunbeg 2
Londonderry
Belfast Lough
Lough Neagh
Belfast
Donegal Bay
Lower L. Erne
Sligo
Upper L. Erne
L. Conn
L. Mask
L. Corrib
Lough Ree
Clifden Rad. 5
Galway
Tullamore
Baldonnel 2
DUBLIN
Kingstown 2
Lough Derg
R. Nore
Limerick
R. Shannon
Ballybunion II
Wexford
R. Blackwater
Waterford
Carnsore D.F. 4
St George's Channel
Valentia Radio 1
Cork
Corkbeg 2
Queenstown 2
Crookhaven II
Fastnet II
C. Clear
Longitude West of Greenwich
10
8
6

XX.

Violations of these Regulations are liable to a fine not exceeding 10,000 krónur, or imprisonment for a term not exceeding six months, if the transgression does not involve a more severe punishment. Illegally erected or operated wireless apparatus will be confiscated.

Lawsuits arising from the violation of these Regulations will be tried in public police courts.

XXI.

These Regulations shall come into force immediately.

Date of Issue: May 17th, 1918.

INDIA

(See British India.)

IRELAND.

(See map on page 344.)

BY the Agreement between Great Britain and Ireland of December 6th, 1921, Ireland was to become a Free State. The territory of the proposed new State includes the whole of Ireland with the exception of Ulster (the latter may be incorporated at a later date).

The Laws and Regulations regarding wireless telegraphy and telephony are at the time of going to press the same as for Great Britain, with the exception that Section 22 of the Defence of the Realm Regulations is still in force (see 1921 Edition for full text).

ITALIAN SOMALILAND

(See Italy.)

ITALY

THE historic kingdom of Italy occupies the central position amongst the three great peninsulas of Southern Europe, and extends from 46° 40′ 12″ to 34° 54′ 54″ North latitude; its longitude stretching from 18° 30′ 37″ to 6° 33′ 7″ East. Before the war the area totalled 110,632 square miles and the seaboard of the peninsula covered 2,272 miles.

The present constitution of Italy is an expansion of the "Statuto Fondamentale del Regno," granted March 4th, 1848, by King Charles Albert to his Sardinian subjects. The executive power of the State belongs exclusively to the Sovereign, working through responsible Ministers; whilst the legislative authority rests conjointly with the King and Parliament, the latter consisting of two Chambers. King Vittorio Emanuele III, born November 11th, 1869, is a direct descendant of the Vittorio Emanuele who was declared King of Italy on March 17th, 1861, by the first Italian Parliament.

The association of Italy with wireless telegraphy has from the start been very close, and the land of his birth has in many different ways recognised what she owes to her distinguished son, Senatore Marconi.

CONTROL.

Wireless telegraph land stations in the Kingdom belong to the Government and are operated by the Ministry of the Navy (Department of Artillery and Armaments), the Ministry of Posts and Telegraphs and the Ministry of War. Each Ministry includes a special department for dealing with wireless telegraphy.

ADMINISTRATION.

The current Rules and Regulations which we print below (and which cover the Italian Colonies) may be summarised in the following List. There are at present none relating to aviation :—

A—Law of June 30th, 1910, No. 395.
B—Regulations (No. 227) of April, 1912.
C—Law of June 30th, 1912.
D—Decree No. 1587, dated November 12th, 1916.
E—Decree No. 2223, dated November 4th, 1919.
F—Decree relating to private correspondence on board ships.



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A The following is known as the Law of June 30th, 1910, No. 395:—

ART. 1.—The establishment and exploitation of the radiotelegraphic and radiotelephonic installations are reserved to the Government, and in general of all those for which, in the State and in the Colonies, on land and on board ship, energy is employed in order to obtain distance effects without the use of conducting wires.

The Government has the right to grant to any person, public or private scientific or training institution, the authority to establish and to exploit installations of such a nature on land and on the passenger and mercantile vessels, for which previous concession must be obtained.

The license may be revoked upon the recommendation of the consulting Commission when the installations cause interruptions of State stations which were in operation prior to the concession, or when they do not comply with the technical conditions established in the license.

The exploitation of the installations granted can be revoked, suspended, or taken over by the Government in time of war or during peace whenever the Government may deem it necessary and opportune.

The Government has also the right to inspect, through its officials, those stations which are not the property of the State, in order to ascertain whether the stations are operated in accordance with the regulations.

ART. 2.—The Government administrations concerned in these services are the Ministry of Posts and Telegraphs, of War and the Admiralty; and special regulations determine the share of the respective departments in the execution of the present law.

A permanent consultative commission is constituted to give opinions upon international agreements, questions of a scientific nature, and upon doubtful points relating to the said services.

The Commission shall also decide every doubtful case which may arise of a technical character regarding the installation and exploitation of the concessions according to Art. 1.

The Commission shall be qualified to determine the power of the radiotelegraphic and radiotelephonic apparatus and technical and economic details for their use on vessels engaged in emigration traffic when the said apparatus has been installed by the Government according to Art. 11 of the Royal Decree, March 14th, 1909, No. 130.

Questions concerning indemnity on account of the cancellation of a license, suspension of exploitation, or redemption as per Art. 1, shall be referred to an arbitration tribunal, which shall decide, without right of appeal. This tribunal shall be composed of three members, one nominated by the Government, one by the licensee, the third by the President of the Tribunal in Rome. The Government can leave to the said Commission the selection of its own arbitrator.

Where several licensees are interested parties to a dispute, and they are unable by mutual agreement to nominate an arbitrator, each shall submit the name of an arbitrator, and the choice will be made by drawing lots in the presence of a judge of the Tribunal of Rome.

The composition of the Commission in the present article and the rules of its working have been determined in the regulations.

ART. 3.—Every infringement of Art. 1 of the present law is punishable by a fine up to £It.2,000 and with imprisonment up to one year, which penalties may be imposed separately and together according to the circumstances. It is in the power of the judge to add to the said penalties the confiscation of the apparatus.

During criminal proceedings the Administration can, in virtue of decree by the prefect, and at all times that in the opinion of the prefect would be in the public interest, obtain immediate possession of the installation and provide if necessary for its removal.

Any person will incur the same penalties if he should avail himself of the installation on board commercial or passenger vessel when they are at anchor in the State waters, except in case of danger or other special cases, which will be dealt with in the regulations.

ART. 4.—If any person shall cause damage or deterioration to installations, or in any other manner interrupt, or cause interruption of the service, even temporarily, he will be liable to the penalties laid down in Art. 315 of the Penal Code, except in the case of military interference with military stations for which offence the penalties stated in the military Penal Code will be imposed.

If any person should abuse the use of the distress signal of the vessels in danger, he will be subject to the same penalties.

ART. 5.—The penalties established by the present law are understood to be applicable, without prejudice to greater offences which may take down in Art. 315 of the Penal Code, except in the case of military Penal Code.

B The following regulations (No. 227) were published in April, 1912, for carrying out the Act of June 30th, 1910 (No. 395):—

SECTION 1.

1. The Ministry of Posts and Telegraphs shall have under its control:—

(*a*) The installation and exploitation of the stations for public service and constituting the interior network of the State and of all those opened for international communication.

(*b*) The verifications, inspection and control of the material and working of the service of all the land installations exploited in virtue of Government license.

(*c*) The tariff regulation for communication between all land stations and ship and shore stations, also accounting.

The Minister of War shall have under his control:—

The installation and working of stations destined exclusively to the military service, including movable field stations for use in the R. Army. In time of war the management of the service (either a part or all the stations destined to the public service) can be taken over by the military administration.

The Admiralty shall have under its control:—

The installation and exploitation of the ship stations of the Royal Navy, private and mercantile; the verifications, inspections and control of the materials and of the working of the service of the installations made for passenger and mercantile traffic.

SECTION 2.

2. *Permanent Consulting Radiotelegraphic Commission.*—The Permanent Consulting Commission is composed of a President not belonging to the Government Administration, two members selected amongst persons of well known ability in electric and radiotelegraphic science, a superior officer of the Royal Navy

attached to the General Staff, and a superior officer attached to the office of the Chief of the General Staff of the Royal Navy.

The following are members of the Commission by right:—

(1) The Director of Posts and Telegraphs Higher Institution.

(2) The Director in Chief of the Radiotelegraphic Department of the Posts and Telegraphs.

(3) The Officer-Director of the Radiotelegraphic Department in the Army Office of Rome.

(4) The Superior Officer of the General Staff of the Royal Navy, Chief of the Department of the Submarines, Electric Material and Radiotelegraphic Service at the Admiralty.

Three members, selected amongst the three mentioned Administrations, will act as Secretaries.

3. The President, members and secretaries will be nominated by Royal Decree, proposed by common accord, by the Ministers of the Posts and Telegraphs, Admiralty, and War.

By Ministerial Decree extraordinary members, without vote, can be added temporarily, these to be selected from persons of well-known skill, proposed by the President of the Commission.

4. The Commission shall have its office at the Admiralty in Rome. The meetings of the Commission are to be convened by the President at the request of the interested Administrations.

5. The opinion of the Consulting Commission can be asked on the following subjects:—

(*a*) On the compilations of arrangements and special rules for the technical organisation of the radiotelegraphic and radiotelephonic service of the State, as well as for practical rules for the constitution and exploitation of the installations.

(*b*) On all questions of a scientific nature, and doubtful cases referring to the radiotelegraphic and radiotelephonic services.

(*c*) On International Conventions.

(*d*) On technical conditions with reference to licenses of radiotelegraphic and radiotelephonic stations.

(*e*) The establishment, before granting the license, of indemnity due in case the installation should be repealed, suspended, or taken over by the State according to paragraph III. Art. 1 of the law.

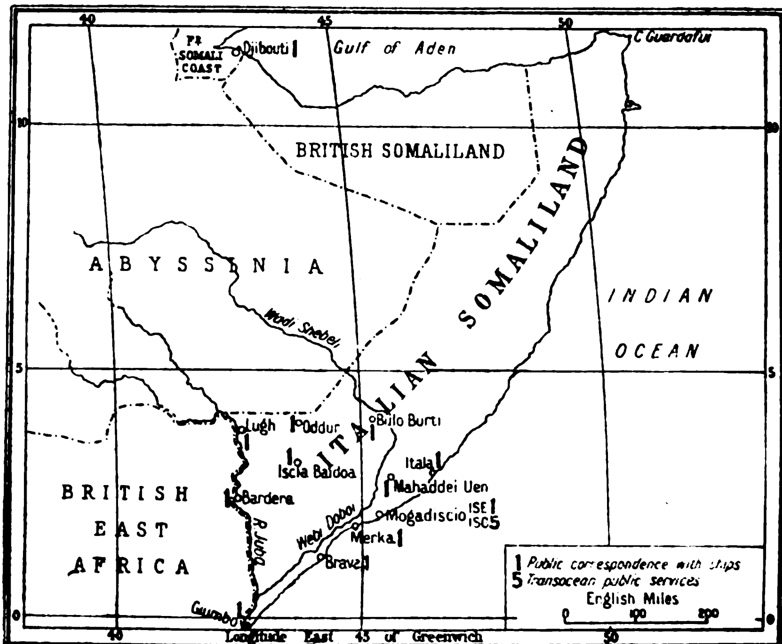
(*f*) Repeal of the licenses.

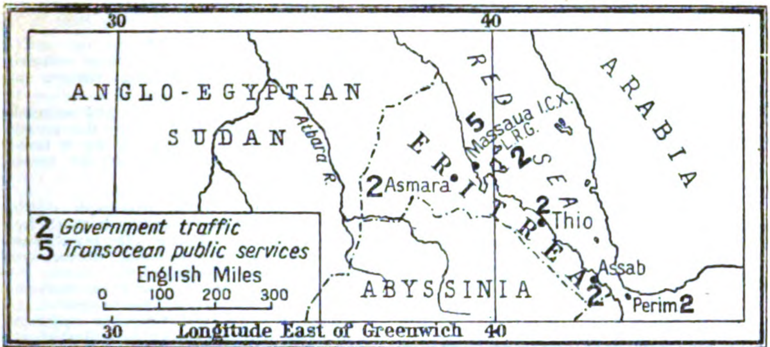
(*g*) On the adoption of new radiotelegraphic and radiotelephonic systems, and on the application of same by the Government service, unless they should deal with interesting systems concerning the defence of the State.

The qualified Administrations may whenever they think it warranted ask the opinion of the Commission on any subject.

The Commission is entitled to avail itself for its own study of the working rooms and of the Government experimental stations, but a previous application must be lodged with the Administrations.

6. The expenses for the working of the Commission are to be divided amongst the three Administrations interested.





Massaua L.R.G. should read I.R.G. Both I.C.X. and I.R.G. are now open for public and general correspondence.

SECTION 3.

7. *Licenses for the Exploitation of Radiotelegraphy and Radiotelephony.*—Licenses to persons, to institutions, and to public and private Administrations for the installation of any radiotelegraphic or radiotelephonic station will be granted in virtue of an agreement containing the conditions to be observed, by a decree issued by the Ministry of the Posts and Telegraphs, acting in harmony with the Ministry of War and the Admiralty.

Such licenses cannot last longer than February 16th, 1917. After this period the license can be renewed.

8. Licenses for radiotelegraphic stations for private use are limited to private correspondence between properties of the same licensee or between properties of two licensees, all correspondence with third persons being absolutely excluded. Such licenses are exempted from tax when the stations are constructed on private property and work over all the territory dividing the stations, without interruption by public land.

Licensees are also exempted from taxes which are granted for installation of radiotelegraphic and radiotelephonic stations having for object a scientific or educational purpose.

9. All applications for licenses for radiotelegraphic and radiotelephonic installations must contain :—

(*a*) The exact indication of the person or institution making the application and their legal residence.

(*b*) The nature and purpose for the license, the place or places where it is proposed to instal the station or stations, and their presumed zone of service.

(*c*) The detailed plans for the construction and technical quality of the installation, indicating in a detailed manner the nature and power thereof.

(*d*) The period for which the license is asked.

(*e*) The period required before starting the station.

(*f*) The receipt of the amount to constitute the deposit-guarantee, as per Art. 13 and 14. Such a deposit must be paid to the cashier of the local Provincial Director of Posts and Telegraphs by the applicant for the license.

10. Every contract by the licensee, having for object the hire, amalgamation, partial or complete transference of the license or licenses, cannot take place before obtaining in advance the approval of the Government.

11. The license is considered as expired should the licensee fail to complete and have ready for service for radiotelegraphic or radiotelephonic installation within the time stipulated as per paragraph (*e*) Art. 9.

The license is considered as expired on the death of the licensee.

12. The officials of the State Telegraphic Administration shall be responsible for the maintenance of the installation and proper upkeep of the radiotelegraphic and radiotelephonic land stations for which a license is granted ; they shall satisfy themselves that the licensee observes the law and the present regulations and that the licensee fulfils all the obligations imposed upon him by his contract with the Government.

13. Every licensee for a radiotelegraphic or radiotelephonic installation for private use, excepting the cases considered in Art. 8, will pay in advance to the State an annual fixed tax of £It.50.

To guarantee the said tax the licensee must make a deposit as guarantee equal to the amount of fixed tax for one year.

14. Every licensee for radiotelegraphic or radiotelephonic installations for public use will pay every year to the State in quarterly instalments a tax corresponding to 10 per cent. of the revenue from radiotelegraphic or radiotelephonic charges on the basis of the common tariff.

To guarantee the said tax the licensee will make a deposit as guarantee of not less than £It.200. If after one year the guarantee shows to be less than the amount due to the State for one year, then the deposit must be brought to the level of such proportion.

15. The period of the license and the obligation of the tax established by Arts. 13 and 14, begin from the month following the decree granting the license.

16. The deposits as per Arts. 13 and 14 will be forfeited to the public exchequer in case of withdrawal or termination of a license.

Should the licensee fail to provide for the payment of the taxes due as per Arts. 13 and 14, the Government will apply the deposit, which

should be increased in its integral amount within ten days of the said confiscation.

SECTION 4.

17. *Qualifications for the Radiotelegraphic and Radiotelephonic Service.*—The staff necessary for the management and working of the radiotelegraphic and radiotelephonic service is appointed as follows:—

(*a*) For the stations under the control of the Ministry of Posts and Telegraphs, from amongst the officials of specialists of first, second, third and fourth class.

(*b*) For the stations under the control of the Ministry of War, amongst the officers and privates of the engineers of the R. Army.

(*c*) For the stations under the control of the Admiralty, from amongst the officers of the staff and the marines.

Should it at any time be found convenient to the management and working of the above-mentioned stations, a mixed staff selected from the three Administrations can be employed.

The Ministry of the Posts and Telegraphs can for an educational purpose always send its own staff to the radiotelegraphic and radiotelephonic commercial stations by making previous arrangements with the interested Administration.

18. The staff to be employed in the radiotelegraphic stations licensed to private persons must possess a certificate proving their professional ability.

Such a document is granted either by the Ministry of Posts and Telegraphs, or by the Admiralty, according to the service for which it is intended.

SECTION 5.

19. *Limitations to the use of Radiotelegraphic and Radiotelephonic Apparatus.*—Cargo and passenger vessels are prohibited from using their own radiotelegraphic or radiotelephonic stations when they are at anchor in the State waters, except in the case of giving warning of danger or appeals for help, or when they are about to sail, or for urgent reasons within half an hour after their arrival and when the communication with the land is cut off for special reasons or for sanitary measures.

A breach of this rule will render the transgressor liable to the penalties imposed by Art. 3 of the law.

SECTION 6.

20. *Taxes.*—The tax for one radiotelegram is composed:—

(*a*) Of the radiotelegraphic tax due to the coast station;

(*b*) Of the radiotelegraphic tax due to the station on board;

(*c*) Of the telegraphic tax.

For taxation purposes only those radiotelegrams exchanged with Ship stations are considered.

21. All the radiotelegraphic and radiotelephonic stations installed before the promulgation of the law must apply for a license within one calendar month of the present regulation.

C The following paragraph relating to Wireless Telegraphy is taken from the "Law of June 30th, 1912," which contains regulations concerning marine, commercial and postal services:—

"The undertakers (of said services) are obliged to adopt (on board their ships........ wireless telegraph and telephone apparatus, whose system and power will be indicated, and, if necessary, modified by the Ministry of the Navy."

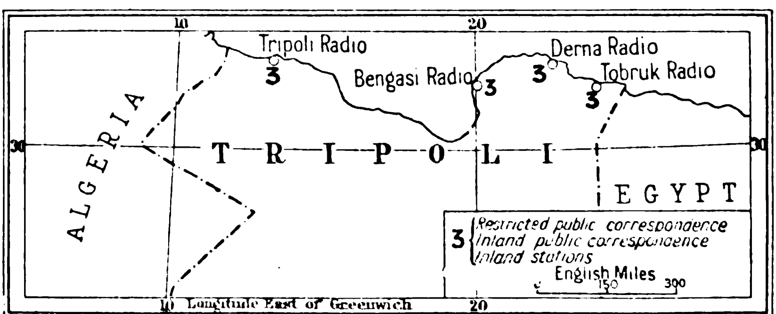
D *The OFFICIAL STATUTE BOOK of the Kingdom of Italy contains the following decree, numbered* 1587 *and dated at Rome November* 12th, 1916.

In pursuance of the law of May 22nd, 1915, No. 671, which confers extraordinary powers on His Majesty's Government and in pursuance of the law of June 3th, 1910, No. 395, and the relative regulations appertaining thereto, approval by Royal Decree of February 1st, 1912, No. 227, and in pursuance of the Royal Decree of July 11th, 1913, No. 1006, which gives effect to the International Radiotelegraphic Convention of London; and the Ministers in Council having given due consideration to the proposals placed before them by the Ministers of Maritime and Railway Transports and of Marine, in concert with the Minister of Posts and Telegraphs;

We have decreed and we hereby decree:—

ART. 1.—All vessels of commerce, whether propelled mechanically or by sails, whether they transport passengers or not, if they have on board a total of fifty persons or more, must, whilst at sea, carry an equipment of radiotelegraphic apparatus.

ART. 2.—From this obligation are exempted vessels on which the number of persons on board is exceptionally and accidentally increased to fifty or more, on account of *force majeure* or because the captain has been obliged to increase the number of his crew to make up for those who are ill, or on account of his having



been obliged to transport persons picked up at sea or other persons.

There are also exempted from this obligation :—

(1) Vessels which during their voyage do not travel at a distance of more than 150 nautical miles from the nearest coast.

(2) Vessels on which the number of persons present on board is exceptionally or eventually increased to fifty or more, after embarkation, during a part of the voyage, of extra hands which it is found necessary to bring in for the handling of goods; on condition, however, that the aforementioned vessels do not perform trans-oceanic voyages and that, during the above-mentioned part of their voyage, they remain within thirty degrees latitude north and south.

(3) Sailing vessels of primitive construction whose build renders it impossible for them to be equipped with radiotelegraphic apparatus.

Art. 3.—Vessels, which by virtue of Art. 1 above-mentioned are required to be equipped with radiotelegraphic plant, are, as regards the Radiotelegraphic Service, divided in three classes, according to the classification of ship stations (prescribed by Article XIII*b*) of the regulations annexed to the Radiotelegraphic Convention, signed in London on July 5th, 1912, viz :—

First Class.—Vessels possessing continuous wireless service. In this first class are included vessels able to carry on board twenty-five passengers or more :—

(i) If they have an average speed of fifteen knots or more.

(ii) If they have an average speed of over thirteen knots, but only on the double condition (*a*) that they have on board 200 persons or more (passengers and crew), and (*b*) that they perform, during their voyage, a journey of over 500 nautical miles between two consecutive ports of call. It is, however, allowable for these vessels to be included in the second class on condition that the listening-in service be continuous.

Second Class.—Vessels possessing a wireless service limited to certain hours.

In the second class are included vessels able to carry on board twenty-five passengers or more, if they are not, for other reasons, included in the first class.

Vessels of the second class must, whilst at sea, keep a permanent listening-in service of at least seven hours per day, and must, in addition, listen-in for ten minutes at the beginning of each of the remaining hours.

Third Class.—Vessels possessing a wireless service with no fixed hours of working.

In the third class are included all vessels which are not included in the first or second classes.

The owner of a vessel included in the second or third class has the right to demand that, in the certificate which is issued to him, the vessel in question be allocated to a superior class, if the said vessel satisfies all the requirements of that class.

Art 4.—Vessels, which by the terms of Article 1 (above) must be equipped with radiotelegraphic plant shall be required to maintain whilst at sea a continuous listening-in service, if the Government shall judge that it is useful for the safety of life at sea.

In any case a continuous watch is required by :—

1. Vessels which possess an average speed of over thirteen knots; which have on board 200 persons or more; and which perform during their voyage journeys of over 500 nautical miles between two consecutive ports of call, even when those vessels are classified in the second class.

2. Vessels of the second class, during the whole time when they are voyaging over 500 nautical miles distant from the nearest coast.

3. Other vessels indicated in Article 1 when they are in the trans-Atlantic service; or, whilst in other services, when their itinerary requires them to go over 1,000 nautical miles from the nearest coast.

Vessels used for all kinds of fishing purposes, including whalers which are required to be equipped with radiotelegraphic plant, are not obliged to maintain continuous listening service.

The continuous listening service can be performed by one or more telegraphists holding one of the certificates prescribed in Article X of the regulations annexed to the International Radiotelegraphic Convention of 1912, and also, if necessary, by one or more qualified listeners (*ascoltatori patentati*).

Nevertheless, should a reliable automatic alarm apparatus be invented, the continuous listening service may be maintained by means of that apparatus, after its use has been duly authorised by the Ministry of Maritime and Railway Transports.

By the term duly qualified listener (*ascoltatore brevettato*) shall be understood a person holding a certificate of competency issued by an administrative authority established for the purpose. To obtain such a certificate, the applicant shall be required to prove that he is competent to receive and to understand the radiotelegraphic distress signal and safety signal.

The registered owner shall take the necessary steps to provide that secrecy with regard to communications shall be respected by the qualified listeners in his employ.

Art. 5.—The Radiotelegraphic apparatus obligatory fitted in accordance with Article 1 must be able to transmit, by day, from vessel to vessel, signals clearly perceptible under normal circumstances and conditions, at a minimum distance of 100 nautical miles.

Every vessel obliged, under the terms of Article 1 above mentioned, to be equipped with radiotelegraphic apparatus (in whatever category it may be classed), be fitted in conformity with Article XI of the regulations annexed to the International Radiotelegraphic Convention of 1912, with an auxiliary radiotelegraphic apparatus, every part of which shall be kept in a location as absolutely secure as possible.

In any case, the auxiliary apparatus must be entirely situated in the upper parts of the vessel, as high up as may be found practicable.

The auxiliary apparatus shall, as provided in Article XI of the regulations annexed to the International Radiotelegraphic Convention of 1912, possesses a source of power devoted to that purpose alone. The apparatus must be capable of being speedily adjusted and employed besides being able to be worked for at least six hours, with a minimum range of eighty nautical miles for vessels of the first class, and of fifty nautical miles for vessels of the other two classes.

If the normal apparatus, the range of which under the terms of this Article covers at least 100 nautical miles, satisfies all the conditions indicated above, there is no obligation to carry also an auxiliary apparatus.

Art. 6.—Every installation must, after the owner has sent in his request, and before it starts working, be inspected and approved by the competent authorities; the Certificate of Inspection, which constitutes a working licence in accordance with Article IX of the regulations annexed to the Radiotelegraphic Convention of 1912, shall contain details of the apparatus as far as they relate to the terms of the concession; it shall be drawn up in duplicate, and one copy thereof shall be handed to the commander of the vessel; but the copy shall not be thus issued if the apparatus does not comply with the conditions laid down in the Radiotelegraphic Convention of 1912 and in the present decree.

Art. 7.—Every captain of a vessel who receives a distress call from a vessel in danger is obliged to go to the help of those in danger.

The captain of every vessel in danger has the right to select from those vessels which have answered his call that vessel or vessels which he considers to be the most capable of affording him help. He should only avail himself of such right after having consulted, as far as possible, the captains of the vessels themselves. The latter are obliged to comply immediately with such request, going with all speed to the help of those in danger.

The captains of the vessels upon whom devolve the duty of rendering assistance are released from their obligations as soon as the captain or captains requisitioned have made known that they are ready to obey the requisition; or as soon as the captain of one of the vessels which has reached the scene of the catastrophe shall have made known to them that their help is no longer necessary.

If the captain of a vessel finds it impossible, or does not consider it reasonable or necessary under the special circumstances of the case, to go to the help of the vessel in danger, he immediately informs the captain of the latter. He must also enter in his log the full reasons prompting his decision.

Art. 8.—With regard to the terms of Article 1, shipowners or their representatives shall, within fifteen days of the publication of the present decree, make application to the Ministry of Posts and Telegraphs for any concession required for existing vessels (in accordance with Article 1) not already equipped with radiotelegraphy and not excused from the installation of such apparatus under the provisions of Article 2.

When it is desired to nationalise any vessels after the date of the present decree, and such vessels come within the scope of the conditions laid down in Article 1, neither the necessary nationalisation papers nor any provisional certificate will be issued unless the shipowner shows that he has made the proper application for a licence to instal radiotelegraphic apparatus on board.

Existing licenses, notwithstanding the provisions of Article 7 of the regulations regarding radiotelegraphy at present in force, shall remain valid throughout the duration of the war. On their expiry the shipowner shall make application for a renewal in accordance with the Article above-mentioned; moreover it is further incumbent upon the shipowner to continue to work the ship station until the new license has been obtained.

On the official license there shall be entered a date on which each ship installation must be ready to work, this date will be estimated on the importance of the services for which the vessel is destined, and in accordance with the opinion of th competent authorities.

For vessels which had a radiotelegraphic station, but which did not have the auxiliary apparatus required under the above-mentioned regulations, there is granted a period of one year from the date of the present decree to put the matter in order.

Art. 9.—Vessels whose owners shall not have made application for a radiotelegraphic license within the period fixed by Article 8; or those whose owners, having obtained their licence, have nevertheless neglected to put the station in working order, either in accord with the above-mentioned provision, or in accord with the term-limit inserted in the license itself, may be refused the right of working cargoes.

Whenever vessels which have not complied with their obligation to instal radiotelegraphic apparatus are obliged to put to sea either because they have public services to fulfil, or for any reason of national importance, the Minister of Transports shall have the power to issue official instruction that the station shall be installed and put in working order at the expense of the owner of the vessel.

The same power is granted to the Minister of Transports in cases where the vessels referred to in Article 1 navigate waters outside the limits set forth in Article 2.

The expenses incurred for such official installation of apparatus and for the putting in working order of the same shall be recoverable in the manner indicated in Art. 205 of the laws governing the Mercantile Marine.

Temporary Provisions.

Art. 10.—It is therefore hereby rendered obligatory for the period of the war (and in any case, for not less than three years from the date of the license) that all mechanically propelled mercantile vessels (of a gross tonnage of 2,000 tons or more in the case of cargo ships and of 1,500 tons or more in the case of passenger vessels) shall instal and maintain radiotelegraph stations in accordance with the existing laws and regulations, even though they are not compelled to apply for a radiotelegraph license in accordance with Article 1.

Art. 11.—At the discretion of the Minister of Transports and following upon a request of the owners of the vessel, those vessels which perform voyages between ports of the Kingdom, excluding the Colonies, and which do not go beyond twenty miles from the coast, may be relieved of the obligation set forth in the preceding Article.

Art. 12.—The regulations contained in Articles 3 and 9 are intended to apply also to those Articles alluded to in these temporary provisions, except as regards the duration of the concession and the obligation to apply for its renewal. However, in the case of these vessels a special auxiliary plant is not indispensable and it will be sufficient if the range of the station does not fall below eighty nautical miles, and that it is possible for regular transmission to be carried out at any moment.

Art. 13.—The Commission for Insurance against war risks at sea, sitting at the "National Insurance Institute," in determining the premiums in respect of vessels, shall take into account the existence on board of radiotelegraph apparatus, whether temporary or permanent, in accordance with these temporary provisions.

Art. 14.—In order to insure the working of the radiotelegraphic service on mercantile vessels, operators not indispensable for the Royal Army and for the Royal Navy, will be exempted from military service at the request

of the Ministry of Maritime and Railway Transports.

Art. 15.—The present decree takes effect from the day of its publication in the *Official Gazette* of the Kingdom of Italy.

We order that the present decree, stamped with the seal of State, be inserted in the official collection of laws and decrees of the Kingdom of Italy, ordering that everyone whom it concerns may observe it or cause it to be observed.

Dated Rome, November 12th, 1916.

Royal Decree No. 2223.

E VITTORIO EMANUELE III.
By the grace of God and the will of the Nation, King of Italy.

Having seen the law of 30th June, 1910, No. 395, and the relative regulations approved by Royal Decree 1st February, 1912, No. 227;

Having seen the Royal Decree No. 1002 of 11th July, 1913, ratifying the International Radiotelegraphic Convention of London, 1912, and the acts thereto annexed;

Having seen the Royal Decree of 28th December, 1913, No. 1480, which extends to the radiotelegraph service in the Italian Kingdom the provisions of the above-mentioned Convention of London;

Having recognised the necessity of establishing—in harmony with the provisions of Article X of the Service Regulations annexed to the aforementioned Convention of London—opportune regulations for the issue of Government certificates to radiotelegraphists desirous of performing radiotelegraph service on board mercantile vessels;

On the proposal of the Minister Secretary of State for the Navy, in agreement with the Minister of Posts and Telegraphs;

We have decreed and we decree:

Art. 1.—Certificates of competency to perform radiotelegraphic service on board commercial vessels, as contemplated in Article X of the Service Regulations annexed to the International Radiotelegraph Convention of London, will be issued by the School of Semaphorists and Radiotelegraphists of the Royal Navy at Spezia (Comando difesa militare) marittima.

2. At the aforementioned school shall be instituted and maintained up to date a general register of all the candidates examined, with particulars of the examination undergone by each candidate, and the result. The school shall also preserve in its archives a copy of the photograph of each candidate, furnished with all the particulars entered in the general register and also a personal description of the candidate.

The Ministry of Marine shall be empowered to authorise, when circumstances require and merely as an exceptional case, that candidates shall be examined at other branches of the Royal Navy, but the examination must always be conducted under the supervision of the officials of the Royal School of Semaphorists and Radiotelegraphists.

Art. 2.—Candidates shall be examined by a suitable commission composed of:

The Director of the aforementioned School or a superior officer of the Staff of the Royal Navy.

Two officers or officials of the Royal Navy who are specialists in radiotelegraphy.

The commission will assemble in the early days of each month.

Art. 3.—Candidates, in order to be admitted to the examinations, shall forward, in due time, an application on stamped paper to the value of two lire addressed to the "Direzione della regia scuola semaforisti e radiotelegrafisti Spezia," and such application must be accompanied by the following documents:

Certificate of study (not less than the "licenza elementare").

Authentic copy of birth certificate proving that the applicant has completed his eighteenth year but is not more than thirty years of age;

"Certificato di penalità" (police certificate of good conduct), the date of which must not be more than two months prior to the date of presentation of such document;

Certificate of good conduct and personal character issued by the Mayor of the Commune in which the applicant is resident, bearing the visé of the Prefect or Sub-Prefect;

Any certificates testifying to the applicant's knowledge of radiotelegraphy and foreign languages;

Certificate of Italian citizenship;

Certificate of entry in the lists of the military or naval levies and the certificate of service performed;

Two photographs;

Postal order for L.2.05, the fee for the certificate of radiotelegraphy. (This amount will be refunded to candidates failing to pass the examination.)

The candidate shall declare in the application whether he has undergone previous examination, and if so the date and place of such examination.

N.B.—A man presenting the certificate of "esito di leva" or the extract of the "matricola della gente di mare" will not be required to present a certificate of Italian citizenship.

All documents shall be presented on paper stamped to the prescribed amount, unless the applicant is able to show, by authentic document, that he is in a state of poverty. The application, however, must always be written on stamped paper.

Art. 4.—Applicants who are admitted to the examinations after having presented the prescribed application duly documented will be notified by the School authorities as to the day on which they are to present themselves to undergo the test.

Art. 5.—The Examining Commission shall rigorously satisfy itself that the candidate fulfils the conditions prescribed in the aforementioned Article X of the Regulations—namely, that he possesses a perfect knowledge of the radiotelegraph apparatus as shall enable him to render efficient radiotelegraph service on board ship.

Candidates must possess the knowledge of radiotelegraphy stipulated in Appendix A (programme of examination for the granting of Government radiotelegraph certificates), signed, on Our order, by the Minister of Marine.

Art. 6.—In addition to the above-mentioned tests candidates must undergo practical tests in transmission and oral reception, the duration of such tests to be not less than ten minutes.

In connection with the provisions of Article X of the Regulations of Service annexed to the International Radiotelegraph Convention of London, shall be issued:

A first-class certificate in radiotelegraphy to those who attain a speed of transmission and oral reception not less than twenty words per minute in a foreign language;

A second-class certificate in radiotelegraphy to those who attain a speed of transmission and oral reception not less than twelve and not exceeding nineteen words per minute in a foreign language. An average of five characters per word shall be taken as a basis for calculation.

ART. 7.—The aforementioned certificate shall be designated "Brevetto internazionale di radiotelegrafista" and shall bear the photograph of the holder, duly legalised by the stamp of the authority of the Royal Navy, and the personal description of the holder and the qualifications attained.

ART. 8.—Applicants who have been declared by the Examining Commission to be unqualified to receive the International Radiotelegraph Certificate cannot present themselves for further examination if at least six months have not elapsed from the date of the first examination.

ART. 9.—Radiotelegraphists who have obtained a second-class certificate in radiotelegraphy shall only undergo the examination to obtain a first-class certificate after three months have elapsed from the date of the last examination.

ART. 10.—Candidates who have been found unqualified after two consecutive examinations cannot undergo a further test without the special and exceptional authorisation of the Ministry of Marine (Direzione generale di artiglieria e armamenti).

ART. 11.—The issue of duplicate international certificates in radiotelegraphy is forbidden without the special authorisation of the Ministry of Marine (Direzione generale di artiglieria e armamenti).

ART. 12.—Radiotelegraphists must undertake to maintain the secrecy of correspondence.

ART. 13.—All violations of the secrecy of correspondence, of the International Radiotelegraph Convention and the relative regulations, and of the general rules governing the working of radiotelegraph stations open to public service will be punished by the temporary or permanent withdrawal of the radiotelegraphist's certificate, according to the seriousness of the infraction committed by the radiotelegraphist, irrespective of any more severe punishment that may be imposed.

ART. 14.—The present decree will enter into force from the day of its publication in the *Gazzetta officiale*.

We order that the present decree, to which has been affixed the seal of State, be inserted in the official collection of laws and decrees of the Kingdom of Italy, and we enjoin its observance upon all those whom it may concern.

Given this day, November 4, 1919, at San Rossore.

VITTORIO EMANUELE,
Sechi-Chimienti.

Seen, The Keeper of the Seals:
Mortara.

APPENDIX A.

PROGRAMME OF EXAMINATIONS FOR THE GRANTING OF GOVERNMENT CERTIFICATES IN RADIOTELEGRAPHY.

Diagram of the various radiotelegraph apparatus used and the working of the individual parts.

A perfect knowledge of such apparatus, its adjustment and method of removing faults.

Tuning of a station. Rules relative thereto. Cimoscopi (?)

Receiving apparatus and the mode of using them.

Sources of energy which feed radiotelegraph apparatus: Dynamos, alternators, transformers, converter groups and converters. Accumulators and their maintenance.

Measures necessary in the practice (working) of radiotelegraphy. Voltmeters, ammeter, methods of insulation.

Antennæ and earth.

Precautions to avoid damage to the material and staff during transmission.

Protection devices of the oscillatory circuits.

Perfect knowledge of the general working rules of radiotelegraph stations open to public service, and also of the International Radiotelegraph Convention and the Service Regulations annexed thereto.

Perfect knowledge of the conventional abbreviations.

Knowledge of foreign languages (optional).

Duties of the radiotelegraphist as regards the radiotelegraph service.

Secrecy of correspondence.

Rome, 4th November, 1919.

Seen, by order of His Majesty the King,
SECHI,
Minister of Marine.

THE MINISTERIAL SECRETARIES OF STATE FOR THE MARINE AND POSTS AND TELEGRAPHS.

In view of the statute of the 30th June, 1910, No. 305 on Radiotelegraphy and Radiotelephony and the Regulation relating, approved by Royal Decree of the 1st February, 1912, No. 227;

In view of Royal Decree of 11th July, 1913, No. 1006 which ratifies the 1912 International Radiotelegraph Convention of London and the acts added to it;

In view of Royal Decree No. 1480 of the 28th December, 1913, extending the provisions of the said Convention to the Radiotelegraphic Service of the kingdom;

In view of the Ministerial Decree No. 1537 of the 12th November, 1916, and the Royal Decree Law No. 1786 of 5th December, 1920, which makes it obligatory for any category of merchant ships to have radiotelegraphic installations on board;

The necessity being recognised that control on private radiotelegraphic correspondence accepted on board ships should be exercised with the due guarantee;

IT IS DECREED:

ARTICLE 1.—In accordance with the provisions of Article X, Clause 4 of the Regulation annexed to the 1912 International Radiotelegraph Convention of London, the radiotelegraphic service of every ship station is placed under the supreme control of the commander of the boat who shall exercise the requisite control over all correspondence.

ARTICLE 2.—No radiotelegraphic correspondence can be transmitted or delivered by the ship station unless passed by the commander of the ship.

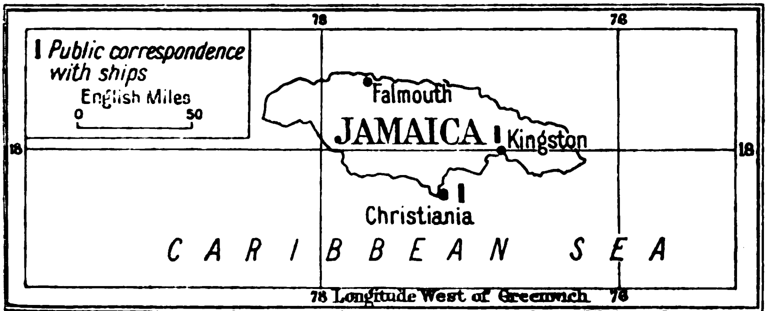
ROME *May 23rd*, 1921.

The Ministers,

Signed........................
Signed........................

JAMAICA

THIS "Land of Wood and Water" is the largest of the British West Indian Islands, covering an area of 4,450 square miles, and situated about 90 miles south of Cuba, between latitude 17° 43′ and 18° 32′ N.; its longitude stretching from 76° 11′ to 78° 21′ W. It was discovered on May 3rd, 1494, by Columbus, and named after St. James. The Governor is assisted by a Privy Council and a Legislative Council, the latter consisting partly of nominated and partly of elected members. There are two wireless stations for public correspondence with ships.



Christiania official correspondence only.

ADMINISTRATION.

The Laws and Regulations under which radiotelegraphy is administered comprise the following:—

A—Telegraph Control Law, 1904.
B—Direct West India Cable Company's Law, 1909.
C—Regulations under Law of 1904.
D—Further Rules and Regulations.
E—Regulations under the Defence of the Island Law.

The Telegraph Control Law (7) of 1904.

A

1. No person shall, within the Colony or any of its Dependencies, establish, maintain or use any telegraphic apparatus, mechanism, or contrivance, of what nature or kind soever the same may be, without due permission or license under the hand of the Governor previously obtained for that purpose.

It is hereby expressly declared that what is commonly known as "wireless telegraphy," including the Marconi apparatus and any similar or other mechanism or contrivance whatsoever for the transmission of telegraphic messages without the employment of wires or cables, is a telegraphic apparatus, mechanism or contrivance within the meaning of this Section.

2. It shall be lawful for the Governor in Privy Council from time to time to make and as he shall see fit repeal, alter or vary rules and regulations for all or any of the following purposes, viz:—

Permitting or licensing any person to establish, maintain, or use any telegraphic apparatus, mechanism, or contrivance, whether for the service of the public or for any private purpose;

Attaching conditions, restrictions, and limitations to the exercise of the privilege by such permission or license conferred:

Providing suitable penalties and forfeitures for the contravention of the prohibition above contained in Section 1 of this law, and to the breach of any rule or regulation made thereunder, and providing for the recovery thereof, summarily or otherwise; provided that the penalty (over and above forfeitures) to be imposed for any one offence shall in no case exceed a fine of Two Hundred Pounds, or in default of payment thereof imprisonment, with or without hard labour, for a period not exceeding twelve months;

The exercise of all such powers and control over telegraphic establishments (by temporarily entering into possession thereof or otherwise) as may be necessary for the public safety, whether at all times, or in any case of emergency which may arise.

And generally for the better carrying out of the purposes of this law.

Such rules and regulations shall come into force as from the date of publication thereof in the *Jamaica Gazette*.

3. Nothing in this law contained shall invalidate or impair any legal right already possessed by any telegraph or cable company, relative to the laying down or landing of any telegraphic cable, the removal, renewal, maintenance, and use thereof, or any other like matter.

4. Law 1 of 1903 is hereby repealed.

LAW 21 OF 1909.

The Direct West India Cable Company's Law, 1909.

B Whereas the Direct West India Cable Company, Limited, is desirous of establishing a wireless installation for communication between ships and the shore in Jamaica;

And whereas under the provisions of Law 7 of 1904, entitled "The Telegraph Control Law, 1904," no person shall establish, maintain or use within the Island of Jamaica, or any of its Dependencies, any apparatus or machine whereby communication by wireless telegraphy can be held between the said Island and ships, without having first obtained the sanction of and a license from the Governor;

And whereas a license to erect such a wireless station has been granted to the Direct West India Cable Company, Limited, by the Governor of Jamaica.

Be it enacted by the Governor and Legislative Council in Jamaica as follows:—

1. The protection, rights, powers, and facilities already granted to the Direct West India Cable Company, Limited, under Law 16 of 1898, entitled "The Direct West India Cable Company's Law, 1898," are granted and extended for the purposes of wireless telegraphy installation to be installed by the company or worked and maintained by them in so far as they may be applicable to the satisfactory and efficient working and maintenance of a wireless station or stations.

2. The Government of Jamaica shall acquire for the use and at the expense of the company a piece of land of sufficient dimensions at a place to be selected by the comapny and approved by the Government suitable and convenient for the economical erection, maintenance, and working of the installation, and when acquired such piece of land shall be conveyed to the company in fee simple, or if the Government of Jamaica possesses a piece of land of sufficient dimensions at a place approved by the company suitable and convenient for the economical erection, maintenance, and working of the installation and which the Government considers it desirable the company should have, the Government may sell the said piece of land at a price to be mutually agreed upon, or the Government may rent it to the company on such terms as may be agreed on during the period of the license or for so long as the company may continue to work a wireless station or stations.

The acquisition of land by the Government of Jamaica under this section shall be deemed as an acquisition for public works within the meaning of the Public Lands Acquisition Law, 1897 (Law 31 of 1897).

REGULATIONS.

It will be noted that under Clause 2 of the Telegraph Control Law (7), 1904, the Governor in Privy Council has the power of making rules and regulations, and a set of rules were accordingly promulgated during the year 1900, under which the working of wireless telegraphy is now being administered in Jamaica. These rules read as follows:—

C 1. Any license granted under Law 7 of 1904 shall only entitle the licensee to establish, maintain and use that particular class of telegraph apparatus, mechanism, or contrivance mentioned in the license. Every license granted under the said law shall make mention of and fully describe the particular class of telegraphic apparatus, mechanism or contrivance which the applicant proposes to establish, maintain and use.

2. Every person establishing, maintaining or using any telegraphic apparatus, mechanism or contrivance in contravention of Section 1 of the Telegraph Control Law, 1904 (Law 7 of 1904), shall be liable to penalty not exceeding two hundred pounds, or, in default of payment, to be imprisoned with or without hard labour for a period not exceeding twelve months, and the telegraphic apparatus, mechanism or contrivance so established, maintained or used shall be liable to be forfeited to the Government of Jamaica.

3. Every person licensed under this law, who uses any telegraphic apparatus, mechanism or contrivance, for which he has not a license shall be liable to the penalty and forfeiture mentioned in Rule 2 hereof, if the Resident Magistrate thinks fit to order such forfeiture.

4. Every person licensed under this law who acts contrary to the terms of this license shall be liable to the penalty and forfeiture mentioned in Rule 2 hereof, if the Resident Magistrate thinks fit to order such forfeiture.

5. Proceedings for penalty and forfeiture under these rules shall not be taken except upon the authority of the Attorney-General.

6. Proceedings for the recovery of any penalty and for any forfeiture under these rules shall be of a summary nature and shall be taken before the Resident Magistrate for Kingston.

Further Rules.

D *Further Rules and Regulations made by the Acting Governor in Privy Council under the Telegraph Control Law, 1904, Law 7 of 1904.*

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of this colony shall be worked in such a way as not to interfere with (*a*) naval signalling, or (*b*) the working of any wireless telegraph station lawfully established, installed or worked in the colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the colony except with the special or general permission in writing of the Governor.

3. These rules and regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

4. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of the wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules and regulations as may be made by the Governor from time to time, and such rules and regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. The master of any merchant ship on board of which apparatus for wireless telegraphy shall be worked or used contrary to these rules and regulations shall on summary conviction before a Resident Magistrate be liable to a penalty not exceeding two hundred

pounds, and in default of payment to be imprisoned with or without hard labour for a period not exceeding twelve months.

REGULATION UNDER THE DEFENCE OF THE ISLAND LAW.

Whereas by the powers conferred by Law 9 of 1915, the Defence of the Island Law, 1915, the Governor in Privy Council on the 7th day of August, 1917, made certain Regulations called the Defence of the Island (Consolidation) Regulations, 1917:

And whereas the said Regulations have been amended from time to time by the Governor in Privy Council:

And whereas it is expedient further to amend the said Regulations in manner hereinafter appearing:—

Now, Therefore, the Governor by and with the advice of Privy Council doth order and it is hereby ordered as follows:—

After Regulation 43 the following Regulation shall be inserted:—

43A. (1) Every British sea-going ship of sixteen hundred tons gross tonnage or upwards in respect of which a license to instal wireless telegraph apparatus has been granted by the Governor in Privy Council shall be provided with a wireless telegraph installation, and shall maintain a wireless telegraph service, and shall be provided with two certified operators, together with suitable accommodation for the apparatus and operators.

(2) Application to the Governor in a form prescribed by him for such a license shall, unless a license has before the making of this regulation been granted in respect of the ship, be made on or before the 1st day of May, 1918, by the owner of every such ship which is registered in Jamaica.

(3) The Governor shall, and when wireless telegraph apparatus and the services of operators become available for the purpose, cause licences to be issued in respect of such ships as in the opinion of the Governor should in the national interests be fitted with such apparatus, and the licenses shall specify the date as from which the carrying of such apparatus, under this regulation is to be compulsory, the character of the apparatus, and the qualifications of the operators.

(4) The Governor may:—

(a) Extend the time mentioned in the licence as the time within which any apparatus is to be provided; and

(b) exempt any ship from the obligations imposed by this regulation.

(5) If the provisions of this regulation or the terms of any license granted thereunder are not complied with in the case of any ship, the master or owner of the ship shall be guilty of a summary offence against these regulations, and if any master fails to make an application in accordance with this regulation he shall be guilty of a summary offence against these Regulations, and in either case if the ship is at any time subsequently found at a port or of within the territorial waters adjoining Jamaica the ship may be seized and detained.

(6) In this Regulation expressions have the same meaning as in the Merchant Shipping Acts, 1894 to 1914.

Made by the Governor in Privy Council this 9th day of April, 1918.

D. H. HALL,
Clerk, Privy Council.

JAPAN

THE total area of Japan is 2,479,436 square *ri* (1 square *ri* is about 2.5 English square miles). This is exclusive of Korea, Formosa, and Sakhalin, the sum of whose area amounts to 1,866,402 square *ri*. The realm ruled by the Emperor Yoshihito lies geographically between 21° 45′ and 50° 56′ N. latitude, and between 119° 18′ and 156° 32′ E. longitude.

CONTROL.

The Department of Communications controls all Government stations and inspects all private stations in Japan. These are divided as follows:—

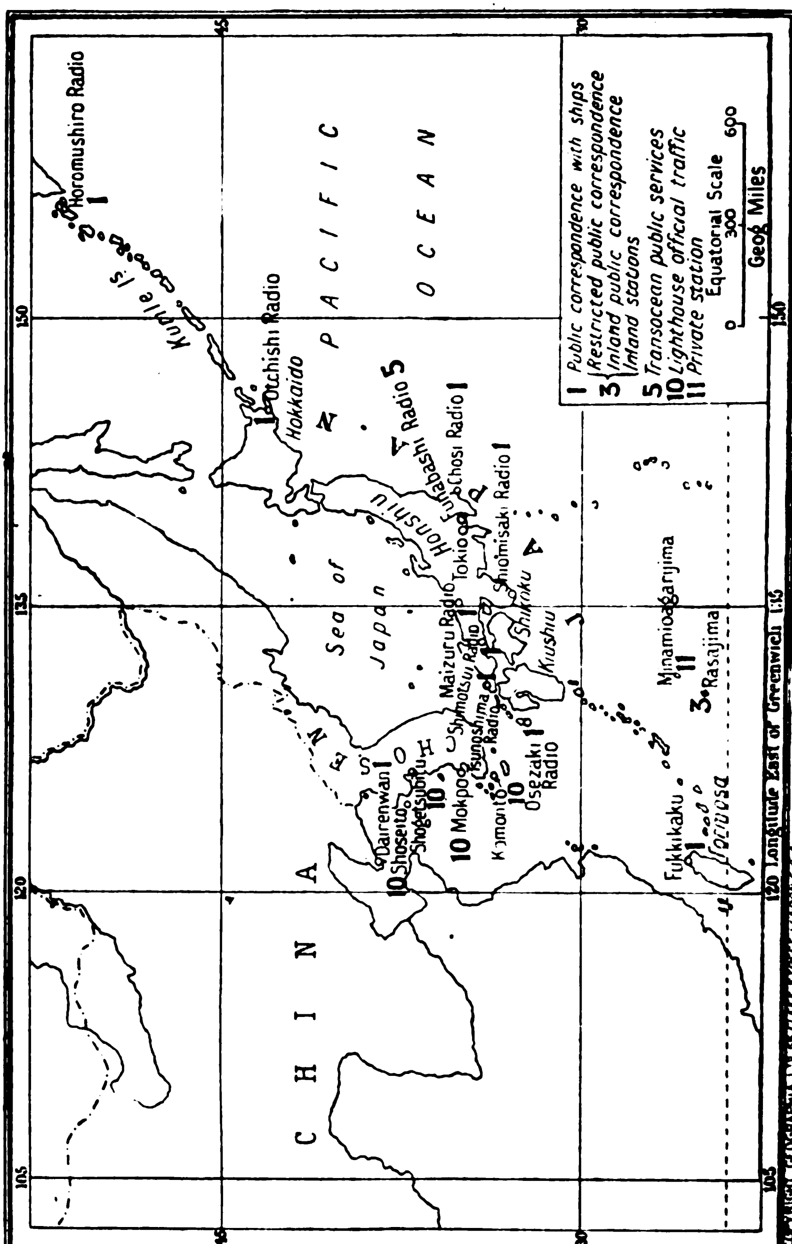
Government Land Stations	9
Private Land Stations	6
Government Ship Stations	45
Private Ship Stations	248

Besides these stations there are five Government stations, under the jurisdiction of the Government-General of Korea and Kuantung, all open for public communication. In addition, there are many Navy and Army stations under the control of the Navy and Army Departments.

Wireless work in the Department of Communications is divided into two sections: (a) The Research Laboratory, and (b) the Installation and Inspecting Section.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. Narakichi Yoneda	Director-General of Posts and Telegraphs	Tokyo
Mr. Utaro Noda ..	Minister of Communications ..	Tokyo
Mr. Toyosuke Hada ..	Vice-Minister of Communications ..	Tokyo


Horomushiro Radio
Kurile Is
Otchishi Radio
Hokkaido
PACIFIC
OCEAN
Sea of Japan
Honshiu
Funabashi Radio
Chosi Radio
Tokio
Shiomisaki Radio
Maizuru Radio
Shikoku
Kiushiu
Osezaki Radio
Mokpo
Dairenwan
Shoseito
CHINA
Fukkikaku
Minamiodagarijima
Rasajima
1 Public correspondence with ships
3 Restricted public correspondence
Inland public correspondence
Inland stations
5 Transocean public services
10 Lighthouse official traffic
11 Private station
Equatorial Scale
0
300
600
Geog Miles
Longitude East of Greenwich

Wireless Research Laboratory.

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ORGANISATION.

The first wireless experiment in Japan was carried on, in 1896, according to the conduction method, and electric-wave telegraphy has formed a subject of Japanese research since 1897, its practical utility being first sufficiently proved by the experience of the Japanese Navy in the Russo-Japanese War. The first commercial wireless station was erected in May, 1908, at Choshi, about 80 miles east of Tokyo. Since that time the number of stations have been largely increased.

There are two leading companies manufacturing wireless apparatus in Japan—the Annaka Electric Manfacturing Co. and Nippon Radio Telegraphy and Telephony Co., Ltd.

Wavelength augmenting apparatus has been jointly invented by Dr. Yamamoto and Professor Kawaharada, of Waseda University, and a wireless signalling appliance, invented by Dr. Mune and Engineers Fujinuki and Itabashi, of the Tokyo Electric Co., have generally affected the wireless field in the world. The invention made by Dr. Torigata for connections between wire and wireless telephones having undergone various experiments has reached the stage of its practical use. Study on high frequency generators in the Navy has also shown a marked progress.

A large wireless station is now working in Formosa constructed by the Japanese Navy with materials produced in Japan. It was opened for service early in 1920.

Several new stations are under construction, and wireless services between Japan and America and Hawaii will soon be in operation *via* the new Iwaki station. The receiving station is at Tomioka, and was opened on May 1st, 1920, and the transmitting station is at Haranomachi, not yet completed.

The Fisheries and each Meteorological Observatory are being installed with wireless, and a new station in Osaka will soon be opened for press services with Europe and America.

The Japanese Government has also decided to erect wireless stations on all the islands along the coast.

A new telegraph training school has been erected at Meguro, a suburb of Tokyo, at a cost of 300,000 yen, and has been specially adapted for the training of radiotelegraph operators.

A fortnightly magazine devoted to the study of wireless telegraphy and telephony, and a monthly magazine named *Musen-no-Nippon*, or *Wireless Press*, are published by the Wireless Press Agency.

ADMINISTRATION.

The first wireless regulations in Japan were promulgated in April, 1908, under the Telegraph Law of 1900. A number of additions and modifications have since been made of these regulations, and these are now incorporated in the Wireless Telegraph Law, which was promulgated and took effect in 1915. The texts of these laws and regulations now in force are shown in the following pages in accordance with the list below :—

A—Wireless Telegraph Law No. 26.
B—Wireless Telegraph Regulations No. 16 (Japanese reference No. 41-48).
D—Foreign Wireless Telegraph Regulations.
C—Regulations relating to Private Wireless Telegraphs.
E—Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs.
F—Regulations regarding the qualifications of wireless operators :—
(i) Substitution of Foreign Operators.
(ii) Qualification of Wireless Operators on Fishing Trawlers.
(iii) Amendment to the Regulations regarding qualifying examination for Operation of private Wireless Telegraphs.

WIRELESS TELEGRAPH LAW.

(Law No. 26, June 19th, 1915.)

A

ART. 1.—All wireless telegraphs and telephones shall be under the control of the Government.

ART. 2.—Wireless telegraphs and telephones referred to below may be privately established with the permission of the responsible Minister, to be determined by an Order.

(i) Installations on board vessels with the object of assuring safety to navigation.

(ii) Installations on board vessels for communication between vessels engaged in a specific business belonging to one person, with the object of facilitating such business.

(iii) Installations on board vessels or on land for the exclusive use of private persons and communicating with telegraph offices for the dispatch and receipt of telegrams, but disconnected from public telegraph, telephone, wireless telegraph or wireless telephone communications.

(iv) Installations on board vessels or on land with the object of facilitating a specific business belonging to one person by mutual communication on land or between land and vessel, disconnected from public telegraph, telephone, wireless telegraph or wireless telephone communications, but to which the preceding clause is not applicable.

(v) Installations with the exclusive object of carrying out experiments in connection with wireless telegraphy or telephony.

(vi) Installations recognised as necessary by the responsible Minister, but not coming within the purview of the preceding clauses.

ART. 3.—Restrictions relating to private wireless telegraph and telephone apparatus, their installation and employment, together with the qualifications of persons operating private wireless telegraphs, will be determined by an Order.

ART. 4.—Private wireless telegraphs and telephones must not be used for purposes other than those for which they were established. Provided that their use shall not be prevented for signals of distress at sea, meteorological reports, time signals and in other cases, to be determined by an Order, where public utility is recognised by the responsible Minister.

ART. 5.—Wireless telegraphs and telephones installed on foreign ships may only be used in accordance with the provisions of Article 2. Provided that their use shall not be prevented for Signals of Distress at sea and for communications with telegraph and telephone offices whilst on voyage.

ART. 6.—The responsible Minister may, by the issue of an Order, cause private wireless telegraphs or telephones to be used for the public service or for communications necessary for military purposes.

In cases coming within the purview of this Article the responsible Minister may, where deemed necessary, send officials to carry out the required operation.

ART. 7.—Where the responsible Minister deems it necessary in the interests of the public communications or on military grounds, he may withdraw his sanction from private wireless telegraphs or telephones or order changes in their equipment.

ART. 8.—Where the responsible Minister deems it necessary for the sake of public security, he may order a restriction of or suspension in the working of or the removal of instruments and accessories belonging to private wireless telegraphs or telephones or

wireless telegraphs or telephones installed on foreign vessels.

In cases coming within the purview of this Article, the responsible Minister may, where deemed necessary, send competent officials to seal up instruments and accessories or to effect their removal.

ART. 9.—Where persons responsible for private wireless telegraphs or telephones have contravened this Law, Orders based on this Law, or provisions arising therefrom, the responsible Minister may withdraw his sanction from such wireless telegraphs or telephones or order the suspension of their operations.

ART. 10.—Where sanction has been withdrawn from wireless telegraphs or telephones established by private persons the dismantling of their apparatus and mountings will be required by order of the responsible Minister. This applies also in the case where private wireless telegraphs or telephones have ceased operations.

ART. 11.—Where private wireless telegraphs or telephones or wireless telegraphs or telephones established on foreign vessels have been called upon to deal with signals of distress at sea, such service must not be refused.

ART. 12.—Immediately on receipt of signals of distress at sea, wireless telegraphs or telephones shall acknowledge them and report to the wireless telegraph or telephone most conveniently situated for purposes of rescue.

In cases coming within the purview of this Article, where request has been made for communication on specific matters, such communication should immediately be made regardless of the provisions of this Article.

ART. 13.—Where the responsible Minister has ascertained that any person has illegally set up a wireless telegraph or telephone, he may appoint competent officials to enter such establishment, inspect the apparatus and mountings thereof, effect the removal of instruments and accessories, and take other steps appropriate to the circumstances.

ART. 14.—The Government may, for the purpose of establishing wireless telegraphs or telephones to meet the needs of public communications, require the use of part of a vessel, and in case of necessity order special provision and equipment. Under the provisions of this Article a suitable rent for accommodation and actual cost of special provision and equipment will be paid by the Government on application.

ART. 15.—Matters relating to the administration of wireless telegraphs, wireless telephones, telegraphs, telephones, mails, postal money orders and post office savings, or signals of distress at sea, time signals and meteorological reports may as determined by an Order be communicated free of charge by the wireless telegraphs or telephones provided for the public service.

ART. 16.—Persons who have set up wireless telegraphs or telephones without permission, or have made use of wireless telegraphs or telephones set up without permission, or those who have made use of private wireless telegraphs or telephones after permission has been withdrawn will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding one thousand yen.

In cases coming within the purview of this Article, where wireless telegraphs or telephones have been placed at the disposal of other persons in return for money or commodities, they shall be confiscated, and the total sum of money or value of commodities already disbursed or handed over shall be collected.

ART. 17.—Persons using private wireless telegraphs or telephones for purposes other than those for which they were established will be subject to a fine not exceeding one thousand yen.

In cases coming within the purview of this Article, where wireless telegraphs or telephones have been placed at the disposal of other persons in return for money or commodities, they shall be confiscated, and the total sum of money or value of commodities already disbursed or handed over shall be collected.

Persons applying to and having messages sent by private wireless telegraphs or telephones will be subject to a fine not exceeding one hundred yen.

ART. 18.—Persons contravening the provisions of Article 5 or disobeying Orders based on this Law for restricting or suspending the use, changing the equipment of or removing or dismantling wireless telegraphs or telephones will be subject to a fine not exceeding one thousand yen. Where persons engaged in the business of wireless telegraphs or telephones have used them in opposition to Orders for their restriction or suspension, this provision shall apply also to such persons.

ART. 19.—Persons refusing without just cause to furnish the use of wireless telegraphs or telephones under the provisions of Article 6 or of vessels or failing to make special provision or equipment under the provisions of Article 14, will be subject to a fine not exceeding one thousand yen.

ART. 20.—Persons violating the secrecy of wireless telegraph or telephone messages coming under treatment at telegraph or telephone offices will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have divulged the secrets of messages under the provisions of this Article they will be subject to imprisonment with hard labour for a period not exceeding two years or to a fine not exceeding five hundred yen.

The offences dealt with in this Article must be established by prosecution.

ART. 21.—Persons illegally evading charges connected with wireless telegraphs or telephone or causing other persons to evade them will be subject to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have committed acts referred to in the preceding paragraph, they will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding five hundred yen.

ART. 22.—Persons dispatching false communications by wireless telegraph or telephone with the object of causing harm to other persons will be subject to imprisonment with hard labour for a period not exceeding two years or to a fine not exceeding five hundred yen.

Persons dispatching false communications by wireless telegraph or telephone with the object of adversely affecting the public welfare will be subject to penal servitude for a period not exceeding five years or to a fine not exceeding one thousand yen.

Persons dispatching by wireless telegraph or telephone reports of shipping casualties when there are in fact no shipping casualties will be subject to imprisonment with hard labour for a period of not less than three months and not exceeding ten years.

Persons engaged in the business of wireless telegraphs or telephones who have committed acts referred to in the first clause will be subject to imprisonment with hard labour for a period not exceeding five years or a fine not exceeding one thousand yen; in the second clause to penal servitude for a period not exceeding ten years; in the third clause to a term of imprisonment with hard labour of not less than one year.

ART. 23.—Where persons engaged in the business of wireless telegraphs have without just cause opened, damaged, concealed or thrown away telegrams sent by wireless telegraphy and coming under treatment at telegraph offices, or have delivered them to persons other than their proper recipients, they will be subject to penal servitude for a period not exceeding three years or to a fine not exceeding five hundred yen. Provided that cases coming within the purview of Articles 258 and 259 of the Criminal Code shall be dealt with according to that Code.

ART. 24.—Where persons engaged in the business of wireless telegraphs or telephones have, without just cause, neglected to deal with general public telegrams or communications necessary for military purposes, or have caused them to be delayed, they will be subject to imprisonment with hard labour for a period not exceeding one year or to a fine not exceeding two hundred yen.

Where persons engaged in the business of wireless telegraphs or telephones have, without just cause, failed to deal with reports of distress to vessels under the provisions of Articles 11 or 12, or have caused them to be delayed, they will be subject to a term of imprisonment with hard labour of not less than one year.

Persons obstructing communication of reports of distress at sea will similarly be dealt with under the preceding clause.

ART. 25.—Persons obstructing, or committing acts calculated to obstruct, general public communications or communications necessary for military purposes sent by wireless telegraph or telephone will be subject to penal servitude for a period not exceeding seven years or a fine not exceeding five hundred yen.

ART. 26.—Unconsummated attempts to contravene the provisions of the last ten Articles are punishable.

ART. 27.—Persons opposing, hampering or avoiding the competent officials appointed under this Law in the execution of their duty or failing to answer their questions or making false statements during the inspection required under the provisions of Article 13 will be subject to a penalty not exceeding one hundred yen.

ART. 28.—The provisions of the Telegraph Law, Articles 4, 5, 11 to 21, 23, 24 and 45 apply to wireless telegraphs and telephones employed for the general public service and communications necessary for military purposes.

SUPPLEMENTARY REGULATIONS.—The date of coming into force of this Law will be fixed by Imperial Ordinance.

The above Wireless Telegraph Law came into force on November 1st, 1915. Imperial Ordinance No. 186, October 25th, 1915

WIRELESS TELEGRAPH REGULATIONS, No. 16.

DATED APRIL 8TH, 1908.

ART. 1.—The expression "wireless telegram" means any telegram to be transmitted by wireless telegraphy.

ART. 2.—In the present Regulations the term "coast station" means any telegraph office on land equipped with wireless telegraph apparatus, and the term "ship station" means any telegraph office on board a ship equipped with wireless telegraph apparatus.

ART. 3.—Wireless telegrams shall bear the following abbreviated instruction :—

"R A" in the case of Romanised telegrams.

ART. 4.—The name of a coast station through which a wireless telegram destined for a ship station is to be transmitted shall be indicated within parentheses in the address of the telegram, but such indication shall not be counted in the number of words even in the case of a Romanised telegram.

In case such coast station cannot transmit the telegram, but there is another coast station which is able to do so, the intermediary of the latter may be resorted to. If a telegram destined for a ship can be delivered direct to the addressee from a telegraph office on land, it may be delivered from such office without the use of wireless telegraphy.

(*a*) Wireless telegrams to be transmitted by way of intermediate ship station, with the exception of those handed in at a ship station, shall bear the following abbreviated instruction :—

"R S" in the case of Romanised telegrams.

Such intermediary transmission can in no circumstances be made more than once.

ART. 5.—If the sender of a wireless telegram destined for a ship station wishes to indicate the term during which his telegram is to be kept at the coast station, the number of days shall be inserted in the telegram as paid instruction.

Wireless telegrams without such instruction will be retained at the coast station for nine days from the day of handing in. However, in case the transmission of a telegram cannot be effected on account of the ship's station leaving out of the radius of action of the coast station or for any other reasons, the telegram may not be retained, if the retention is deemed unnecessary.

ART. 6.—If the sender wishes to prolong the term of retention mentioned in Art. 5, application to that effect shall be made to the coast station before the expiration of the term. The same applies to further prolongation of the term. In such case, the term of retention will be nine days, unless specially indicated.

The application shall contain the date of handing in, number of characters or words, and the names of the sender and addressee of the wireless telegram.

The sender may make the application mentioned in paragraph 1 through the office of origin. If he wishes it notified to the coast station by telegraph, he shall pay the charge for a paid service telegram for the purpose.

ART. 7.—The transmission of a wireless telegram is to be effected when both the sending and receiving offices are within the guaranteed range of action of each other.

ART. 8.—In the case of ships' distress, wireless telegrams informing the name of the ship in distress the location and condition of the doomed vessel and any other particulars neces-

sary for rescue, shall be treated by coast or ship stations with absolute priority suspending all other communications.

ART. 9.—Paid service telegrams concerning enquiry, rectification, and stoppage of a wireless telegram to which reply is required can be exchanged only between telegraph offices on land.

ART. 10.—" Urgent telegrams," " redirected telegrams," and " telegrams with acknowledgment of receipt " are admissible between telegraph offices on land.

The sender of a wireless telegram with acknowledgment of receipt will be notified of the date and time at which the coast station has transmitted the telegram to the ship station.

(*a*) Telegrams of the same text originating from the same ship station or from the same telegraph office on land, and passing through the same coast station, may be made a multiple telegram, so far as concerns the transmission between wireless telegraph stations or between telegraph offices on land, as the case may be, no matter whether the addresses of such telegrams be in different localities or they be served by different offices of destination. The telegram shall bear the following abbreviated instruction instead of that for an ordinary multiple telegram:

"S M" in the case of Romanised telegrams.

Paragraph 2 of Article 4 is not applicable to the multiple telegram mentioned in the preceding paragraph when it is to be distributed to two or more ship stations, unless every copy of such telegram can be transmitted through the same coast station or delivered from the same telegraph office on land.

(*b*) Reply-paid wireless telegrams shall bear the abbreviated instruction for " reply paid," " urgent reply paid," or " collated reply paid," completed by the mention of the prepaid amount. If a prepaid amount is 60 sen in the case of *kana* telegrams, and 75 sen in the case of Romanised telegrams, the mention of the amount is not required.

ART. 11.—Wireless telegrams are subject to the following charge for the operation at a coast station or a ship station in addition to the ordinary telegraph charge. It is provided, however, that the ordinary telegraph charge is not levied on a telegram which is to be transmitted only by wireless telegraphy.

For Government and Ordinary Telegrams:

Coast Charge.—For a *kana* telegram, 20 sen up to fifteen characters; 5 sen for every additional five characters or less. For a Romanised telegram, 25 sen up to five words; 5 sen for every additional word.

Ship Charge.—Ditto.

For Press Telegrams:

Coast Charges.—20 sen for every fifty characters or fraction thereof.

Ship Charge.—Ditto.

(*a*) The following charge is levied in the same way as mentioned in the preceding Article on a supplementary copy of a multiple wireless telegram.

For Government and Ordinary Telegrams:

Coast Charge.—For a *kana* telegram, 10 sen; for a Romanised telegram, 15 sen.

Ship Charge.—Ditto.

For Press Telegrams:

Coast Charge.—One-half the charge for the original telegram.

Ship Charge.—Ditto.

(*b*) If, in the case where Paragraph 2 of Article 4 is applied, the amount paid fall insufficient, the deficiency is collected from the addressee. In the case of a multiple telegram the amount to be collected is divided by the number of copies, and the quotient shall be the sum collected from one addressee.

ART. 12.—Wireless telegrams are free from special charge applicable to telegrams handed out of the ordinary hours of duty.

ART. 13.—The following charges for a wireless telegram shall be refunded less the amount which had been appropriated for another charge:—

(1) The charges pertaining to the transmission by wireless telegraphy when not effected.

(2) The charges pertaining to the transmission on telegraph lines when not effected.

ART. 14.—An application for the refund of charges for a wireless telegram handed in at a ship station may be sent in through any telegraph office.

ART. 15.—The term of retention mentioned in Articles 5 and 6 is not reckoned in the period of delay giving rise to refunds.

ART. 16.—Matters not expressly provided for in this Ordinance are subject to the other regulations relating to inland telegrams. Provided that the Regulations relating to Telegrams, Articles 71, 114, 121, 126 to 130, 146 to 148, 148 (vi) to 148 (x), Ordinance No. 46, issued by the Department of Communications in September, 1900, shall not apply.

(*a*) With the exception of Article 9 to Article 10 (*b*) and the proviso in Article 16, the regulations in this Ordinance shall apply in the treatment of connected service between wireless telegraphs and the reciprocal dispatch and receipt of telegrams on land. Provided that, if deemed necessary by the Department of Communications, charges for such service shall be specially fixed.

The treatment of, and special fixing of charges for, wireless telegrams referred to in the preceding clause will be separately notified.

FOREIGN WIRELESS TELEGRAPH REGULATIONS.

C The following supplementary regulations came into operation on July 1st, 1913, and apply to all Japanese possessions:—

ART. 1.—Foreign wireless telegrams are understood to be those which are treated according to the regulations of the London International Radiotelegraphic Convention or to the regulations concerning the radiotelegraphic service concluded between the Government of the Empire and foreign Governments or companies.

ART. 2.—The rates to be charged for foreign messages through Japanese coast and ship stations are as follows:—

(1) Coast station rate, 24 yen (fr. 0.60) per word.

(2) Ship station rate, 16 yen (fr. 0.40) per word.

The coast station rate referred to in the preceding paragraph includes the rate applicable to the transmission on telegraph lines for wireless messages originating in or destined for the Japanese Empire or Southern Manchuria or for ship's stations and the Japanese telegraph service. As regards urgent wireless messages for transmission over land lines, an extra 10 yen (fr. 0.25) will be charged.

ART. 3.—The rates to be charged for foreign

radiotelegrams through foreign coast or ship stations will be indicated separately.

ART. 4.—The ordinary rate for foreign wireless messages accepted by a Japanese ship station for transmission through a foreign coast station will be fixed by the owners of the said foreign coast station.

ART. 5.—For the acknowledgment of receipt of foreign wireless messages handed in at a Japanese telegraph office and destined for a ship station and transmitted thereto through a Japanese wireless coast station, the rate for the acknowledgment of receipt of interior telegrams for transmission between Japan and Southern Manchuria will be charged.

ART. 6.—At the request of the receiver, or of the person empowered to receive messages for and on behalf of the receiver, wireless messages may be retransmitted only over Japanese land lines.

ART. 7.—When the Japanese coast station given by the sender of a foreign wireless message destined for a ship cannot transmit the said message it may be transmitted through another Japanese coast station, provided such station is suitable for the purpose. This provision also applies in case the Japanese ship station cannot transmit a foreign wireless message to a Japanese coast station mentioned by the sender and where another Japanese coast station exists and which is capable of performing the duty.

ART. 8.—Japanese ship stations cancel foreign wireless messages when they are not in a position to transmit the same to the corresponding stations.

ART. 9. (i)—Should a foreign wireless message be cancelled in accordance with Article 8, the sender shall be at once advised and the money paid by him returned without delay.

(ii) Foreign wireless telegrams passing between the Imperial [Japanese] Telegraph Office in Shanghai and Imperial ship stations through the intermediary of Imperial coast stations and, as circumstances require, ship stations may be entered in the Japanese language.

(iii) Article 3, Article 4, clauses i and ii and Article 5, clause i, of the Wireless Telegraph Regulations. Ordinance No. 16 of the Department of Communications, issued in April, 1908, provide for foreign wireless telegrams in Japanese.

(iv) Reply prepaid foreign wireless telegrams in Japanese must be marked "reply prepaid," followed by the amount paid for reply.

(v) Foreign wireless telegrams dispatched or received at the places announced separately will be transmitted through the intermediary of telegraph offices specially indicated.

(vi) The treatment of foreign wireless telegrams in accordance with the preceding Article is subject to the general regulations relating to foreign telegrams.

ART. 10.—Matters not specially provided for in this Ordinance, as regards Japanese telegrams, foreign telegrams in Japanese, and other items, are subject to the general regulations relating to foreign telegrams.

REGULATIONS RELATING TO PRIVATE WIRELESS TELEGRAPHS.

D (Ordinance No. 46, Department of Communications, October 26th, 1915.)

ART. 1.—The words "disconnected from public communications" in clauses iii and iv Article 2, of the Wireless Telegraph Law mean that the location for fitting up private wireless telegraph apparatus must be outside the boundaries of direct telegram delivery or telephone subscription or on vessels on which no telegraph office is established.

ART. 2.—Wireless telegraphs set up in accordance with clause v, Article 1, of the Wireless Telegraph Law are limited to provision for experiments connected with the science and apparatus of wireless telegraphy.

ART. 3.—Permission will be given to the furnishing of vessels with aerial apparatus and its use for wireless telegraphy by private persons.

ART. 4.—The apparatus and equipment of private wireless telegraphs, except in specially indicated cases, will be required to conform with the following clauses :—

(i) The apparatus must be capable of transmitting eighty *kana* characters or twenty European words per minute.

(ii) The receiving apparatus must be capable of receiving messages transmitted on electric wavelengths of from 100 to 1,800 metres.

(iii) The power supplied to the transmitting circuit corresponding to the distance required to be reached in the daytime must not exceed the following standards (measured at the primary coil of the transformer or at some point corresponding thereto).

Required daytime distance.	Electric power.
20 naut. miles, not exceeding	1/4 kilovolt amps.
100 ,, ,, ,,	1/2 ,, ,,
200 ,, ,, ,,	1 ,, ,,
300 ,, ,, ,,	2 ,, ,,
400 ,, ,, ,,	3 ,, ,,
500 ,, ,, ,,	7 ,, ,,

(iv) The electric waves should be pure and suffer but little diminution. The installation must be capable of using waves of such length as may be specifically indicated between 100 and 1,800 metres.

ART. 5.—The establishment and maintenance of private wireless telegraphs required to be installed at certain telegraph offices in accordance with clause iii, Article 2, of the Wireless Telegraph Law will be carried out by the Communications Office having local jurisdiction or a first-class post office dealing with branch administrative business.

Persons establishing private wireless telegraphs under this Article must be responsible for the supply of and expenditure on articles required for their establishment in accordance with details furnished by the Communications Office having local jurisdiction or the first-class post office dealing with branch administrative business, and must further pay expenses of maintenance.

ART. 6.—Persons proposing to establish private wireless telegraphs must append to their application documents inscribed with particulars under the following headings, submitting the whole to the Minister of Communications. Changes occurring under headings (i) to (iv) must similarly be notified.

(i) The object of the installation and grounds for its necessity.

(ii) Site of installation (full address or name of vessel).

(iii) Plan of construction (nature of apparatus, method of mounting, height of electric standards [masts], electric power, distance required to be reached in the daytime, details of supplementary equipment where required).

(iv) Hours open for operation.

(v) Nature of vessel, gross tonnage, owners, course navigated, and regular port of mooring (the principal home port of anchorage should be taken as the regular port of mooring).

(vi) Time required for completion.

The site of installation on vessels under heading (ii) and the plan of construction under heading (iii) should be illustrated by separate drawings.

ART. 7.—Where changes have been made in details under headings (v and vi) of the preceding Article, they must at once be notified to the Minister of Communications. In the case where the regular port of mooring has been changed such change must be notified also to the Communications Office having jurisdiction over, or the first-class post office dealing with branch administrative business at, the former port of mooring.

ART. 8.—When the fitting up and construction of a private wireless telegraph have been completed, the fact must at once be notified to the Minister of Communications.

ART. 9.—When the Minister of Communication has received a report under the preceding Article, he will send inspectors to examine the apparatus and fittings, after which a license will be granted. Provided that where a special inspection is not deemed necessary a license may be issued forthwith. If deemed specially desirable by the inspectors under this Article a temporary license will be issued for the opening of operations by the private wireless telegraph concerned.

ART. 10.—When a private wireless telegraph establishment is to be closed up, a notification to this effect must be sent to the Minister of Communications seven days earlier. Similar notice must be given in the case of suspension of a private wireless telegraph establishment.

ART. 11.—When a private wireless telegraph establishment has been closed up, the aerials must be removed immediately, and, unless special instructions have been given, apparatus specially pertaining to wireless telegraphy—dynamos, secondary electric batteries, distributing apparatus, electromotors, motor generators, transformers, electric standards, transmitters, receivers, meters, etc.—must be dismantled and removed within ten days. Where sanction to a private wireless telegraph has been withdrawn the same provision applies.

ART. 12.—When a change is made in the proprietorship of a wireless telegraph installation, a written application for permission, jointly signed with both old and new names, must be submitted to the Minister of Communications.

Where, owing to succession on the decease of the proprietor or other causes, joint signatures cannot be obtained, a certificate to this effect must be appended to the application.

ART. 13.—The length of electric waves and the call signal to be adopted by a private wireless telegraph will be decided by the Minister of Communications.

ART. 14.—When a private wireless telegraph has been sanctioned by the Minister of Communications details of the installation under the following headings will be officially announced. This applies also to changes effected therein :—

(i) Name of person setting up installation.

(ii) Object of installation.

(iii) Site of establishment.

(iv) Call signal.

(v) Ordinary range of distance.

(vi) Method of fitting up.

(vii) Electric wavelength used.

(viii) Hours open for operation.

ART. 15.—Operators of private wireless telegraphs are required to possess the proper qualifications in conformity with the Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs. Provided that exception be made in the case of operators of private wireless telegraphs established in accordance with clause v, Article 2, of the Wireless Telegraph Law, who have received the special sanction of the Minister of Communications.

ART 16.—Proprietors of private wireless telegraphs must notify the Minister of Communications of all appointments or dismissals of operators in the employ. In the case of appointments, copies of antecedents form, certificate of physical examination and certificate of eligibility awarded on qualifying examination for operators of private wireless telegraphs must be appended.

ART. 17.—Where the Minister of Communications has ascertained that an operator of a private wireless telegraph is incompetent in the performance of his duties he may order the dismissal of such operator.

ART. 18.—A private wireless telegraph establishment shall not begin operations until a license or temporary license has been received in accordance with Article 9.

ART. 19.—When a private wireless telegraph establishment has begun operations the Minister of Communications must at once be notified accordingly. Provided that when the installation is one set up in accordance with clause iii, Article 2, of the Wireless Telegraph Law, notification will be required seven days before the opening of operations.

This Article applies also to reopening of operations after notification of suspension has been made in accordance with Article 10.

ART. 20.—The employment of private wireless telegraphs is required to conform with the following paragraphs. Provided that exception be made in the case of communications falling within the purview of Articles 22 to 24.

(i) Only when not causing disturbance to messages sent by the general public or to military communications.

(ii) In the case of installations on vessels, only whilst on voyage.

(iii) In the case of installations set up in conformity with clause v, Article 2, of the Wireless Telegraph Law, only when not causing disturbance to communications from other wireless telegraphs.

ART. 21.—Communications sent by private wireless telegraphs must be in Morse symbols, and the method of transmission, except where special instructions are issued, must conform with the following provisions :—

(i) Before making a call, the receiver must be regulated to the best degree of perception to determine whether a message is already in transmission. A call must not be made until such message, if any, is completed.

(ii) When making a call the "begin communication" signal — • — • — must first be sent, followed by the call signal of the party signalled, repeated three times, then the introductory signal — • • • followed by own call signal, repeated three times.

(iii) When the signalled party replies, he must send the "begin communication" signal — • — • — followed by the signalling party's call signal repeated three times, then the introductory signal — • • • followed by his own call signal and the "clear for transmission" signal — • —. This applies also in the case of a reply to the call under provision vi.

(iv) When there is no reply from the signalled party to the call made under provision ii, repeat the signals in proper order three times at intervals of two minutes. If there is still no reply, allow fifteen minutes to elapse, then make the call again in the same manner.

(v) When communicating with the signalled party by means of the international shipping signals, continue the call by sending the international shipping signal PRB.

(vi) When wishing to detect a wireless message within own range, use the "Inquiry signal" — • — • — — • — and make the call provided under (ii).

(vii) When the signalled party replies, begin the required message immediately, and at its ending send the "end communication" signal • — • — • and own call signal, followed by the "clear for transmission" signal — • —

(viii) When the signalled party has comprehended the message, he must immediatoly signify its receipt by sending the signal "understand communication" — — — — • —

(ix) When mutual messages have been completed, both parties must exchange the "finished" signal • • • — • — and their own call signals.

(x) When in the case of an experimental message sent out by a wireless telegraph established in accordance with clause v, Article 2, of the Wireless Telegraph Law the call signal of another party is not required, repeat own call signal three times and after ascertaining that there is no danger of hindering another message, begin the required communication, and at its ending send the "end communication" signal • — • — • and own call signal. Provided that such communication must not exceed twenty minutes in duration.

Art. 22.—When dispatching a signal of distress at sea by private wireless telegraph, the preliminary "ship in danger" signal, • • • — — — • • • should be repeated at frequent intervals according to circumstances followed by the name of vessel in distress, position, and details of conditions and other matters likely to facilitate rescue. If it is desired to get into touch with a specified wireless telegraph a continued series of the "ship in danger" signal • • • — — — • • • should be followed by the call signal of the station signalled.

Art. 23.—When a private wireless telegraph detects the "ship in danger" signal • • • — — — • • • accompanying a message of distress at sea, it must suspend all other messages and immediately reply, and report details in the order specified in the last Article to another wireless telegraph situated at the most convenient point for purposes of rescue. Provided that where the message of distress includes a request for specified action before transmitting the report or for specified items to be included therein, such request must be complied with.

In the case of a continued series of the "ship in danger" signal • • • — — — • • • being followed by the call signal of a specified station, only in the event of no reply being received therefrom should the responsive steps be taken prescribed in the last paragraph.

Art. 24.—When sending out by private wireless telegraph a necessary warning of danger to navigation, repeat the preliminary navigation alarm signal TTT ten times at short intervals, then transmit necessary details, after which, allowing an interval of ten minutes to elapse, repeat the alarm three times. When a private wireless telegraph detects the navigation alarm signal TTT accompanying a necessary warning of danger to navigation, it must suspend all other messages.

Art. 25.—A private wireless telegraph shall not be prevented, in cases of messages coming under the provisions of the last three Articles only, from exceeding the prescribed limit of electric power or wavelength used. Provided that, immediately after such use, the prescribed limits shall be reverted to.

Art. 26.—When a telegraph office has sent out by wireless telegraphy the private "suspend communication" signal — • • • • — all private wireless telegraph messages within such office's range of distance must be suspended until the private "renew communication" signal • — — • • — — • is issued.

Art. 27.—A private wireless telegraph shall not be prevented, in the cases referred to below, from operating outside the objects for which it was established.

(i) When deemed necessary to exchange messages with other wireless telegraphs concerning communications coming within the purview of Articles 22 to 24.

(ii) When deemed necessary to exchange messages with other wireless telegraphs in connection with meteorological and time signals or the adjustment of apparatus.

(iii) When rendered necessary to communicate with a telegraph office equipped with wireless telegraph apparatus, following instructions issued by such office.

(iv) When deemed necessary to exchange messages with military wireless telegraphs to meet the requirements of military communications.

Art. 28.—When a private wireless telegraph has received a request from another wireless telegraph to exchange messages for the purpose of adjusting apparatus, it shall respond thereto, provided there is no danger of obstruction.

Art. 29.—The Minister of Communications shall specially instruct the Wireless Telegraph Inspection Bureau to test a private wireless telegraph with a view to ascertaining whether it is properly employed and whether its communications are in order.

Art. 30.—When sending instructions to a private wireless telegraph relating to its communications, the Wireless Telegraph Inspection Bureau will prefix to its call signal the wireless telegraph inspecting signal • — • • • — • in order to distinguish its message from general communications.

Art. 31.—Where an order is sent direct to an operator relating to the restriction or suspension of operations by the private wireless telegraph operated by him or the removal of its apparatus and accessories, the person responsible for the installation will be separately notified.

Art. 32.—When a vessel with a private wireless telegraph on board comes within the wireless telegraph range of a telegraph office it must briefly report to such office its direction and distance therefrom, together with the direction in which the vessel is moving. When about to withdraw from the range of such office a similar report must be sent.

Art. 33.—The person responsible for a private wireless telegraph must report to the Minister of Communications, at the same time giving details, on all circumstances falling under the following headings :—

(i) When special restrictions have been imposed on the equipment and operation of the wireless telegraph concerned in foreign waters. Provided that exception be made where such restriction has been officially announced.

(ii) When messages have been sent in accordance with Articles 22–24.

(iii) When cases of contravention of the Wireless Telegraph Law or the Regulations connected therewith on the part of a private or foreign wireless telegraph have been detected.

(iv) When matters have arisen calling for special attention in regard to the results of wireless telegraphy or other features.

Art. 34.—The person responsible for a private wireless telegraph must keep a journal and cause the operator to record therein the items coming under the following headings :—

(i) Time of beginning and end of messages, and wireless station signalled.

(ii) Nature of message.

(iii) The circumstances coming under Articles 27 and 33, and the steps taken in accordance therewith.

(iv) In the case of private wireless telegraphs established in accordance with Clause v, Article 2, of the Wireless Telegraph Law, the results of experiments.

(v) In addition to the matters under the above headings, references for future use.

Communication journals as prescribed in this Article must be preserved for fifteen months, counting from the month following that in which they are completed.

Art. 35.—The person responsible for a private wireless telegraph must affix in his operating room, where they can easily be seen, his certificate, together with copies of the penal clauses of the Wireless Telegraph Law and a list of the essential objects for which the installation was established.

Art. 36.—The Minister of Communications will from time to time specially send officials to examine reports, and documents connected therewith, on the apparatus mounting and operations of private wireless telegraphs, in such cases the officials concerned will carry proof of their competency.

Art. 37.—Documents to be sent in under the provisions of Articles 7, 8, 10 and 19 may be replaced by telegrams.

Art. 38.—Documents to be submitted under this Ordinance to the Minister of Communications, with the exception of those coming under the preceding Article, must all be passed through the Communications Office having jurisdiction over, or the first-class post office dealing with branch administrative business at, the place of a land installation or the regular port of mooring of a vessel having an installation.

Supplementary Regulations.

Art. 39.—The provisions of Articles 1 to 3, 5 to 14, 18 to 20, 22 to 38, apply to private wireless telephones, and the provisions of Articles 22 to 24, 26, 29 to 31 and 36 apply to wireless telegraphs or telephones installed on foreign vessels.

Art. 40.—This Ordinance comes into force on November 1st, 1915.

Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs.

(Ordinance No. 48, of the Department of Communications, October 26th, 1915.)

Art. 1.—Persons aged seventeen or above qualifying for posts as operators of private wireless telegraphs will be examined and approved according to the following classification :—

Class I.—Persons capable of operating private wireless telegraphs set up under the provisions of the Wireless Telegraph Law, Article 2.

Class II.—Persons capable of acting as assistant operators of private wireless telegraphs set up under the provisions of the Wireless Telegraph Law, Article 2 (except those set up under clause iii) and of private wireless telegraphs set up under the provisions of clause iii of the same Article.

Class III.—Persons capable of acting as assistant operators of private wireless telegraphs set up under the provisions of the Wireless Telegraph Law, Article 2, clause v, and of private wireless telegraphs set up under the provisions of any one of the clauses of the same Article.

Art. 2.—Examinations will be carried out by the Qualifying Examination Committee for Operators of Private Wireless Telegraphs appointed by the Minister of Communications. The subjects for examination are as follows :—

(1) Wireless Telegraphy: Theory (for Class I only), adjustment and use of apparatus (for Classes I and II only).

(2) Practical Electric Telegraphy: Transmission of a message in Japanese and a European language and reception of a message by sounder. Standard of speed to be—for Class I, eighty *katakana* characters (syllables) or twenty European words per minute; and for Classes II and III, fifty *katakana* characters (syllables) or twelve European words per minute.

(3) Wireless Telegraph Laws and Regulations: General Laws and Ordinances relating to wireless telegraphs (for Classes I and II only); Laws and Ordinances relating to private wireless telegraphs (for Class III only).

(4) English language: Rudiments (for Classes I and II only).

Art. 3.—The Minister of Communications will award certificates of eligibility (form No. 1) to successful candidates in the examination.

Art. 4.—Persons who have had not less than two years' practical experience in the public telegraph or wireless telegraph service or in military wireless telegraphy may be granted certificates of eligibility according to the following classification without undergoing examination, on review by the Qualifying

Examination Committee for Operators of Private Wireless Telegraphs.

(1) Persons engaged in the public wireless telegraph service—for Class I or lower.

(2) Persons engaged in military wireless telegraphy—for Class II or lower.

(3) Persons engaged in the public telegraph service—for Class III.

These provisions apply also in the case of persons holding second or third-class certificates of eligibility according to the following classification:

(1) Persons holding second-class certificates of eligibility who have been engaged for not less than two years as assistant operators of private wireless telegraphs established in accordance with the Wireless Telegraph Law, Article 2. clause iii—for Class I.

(2) Persons holding third-class certificates of eligibility who have been engaged for not less than two years as assistant operators of private wireless telegraphs—for Class II.

ART. 5.—Persons holding a certificate of study for completion of training in wireless telegraphy, practical electric telegraphy, and Wireless Telegraph Laws, and Regulations, in accordance with the classifications determined by the Ministry of Communications, with the object of engaging in wireless telegraphy, may be granted certificates of eligibility, for Class I or lower, on review.

ART. 6.—Examinations will be held annually. Date, place and other details thereof will be announced in the *Official Gazette*. Provided that if deemed necessary by the Minister of Communications extra examinations may be held at special times.

Reviews by the examiners will take place according to circumstances.

ART. 7.—Candidates for examination must submit to the Minister of Communications before the appointed date an application in writing (Form No. 2), appending thereto a statement of antecedents (Form No. 3), an abstract of the Census Register, and a photograph.

ART. 8.—Candidates for examination must pay an examination fee of two yen in Class I and one yen in Classes II and III, affixing to the application form a revenue stamp for the amount.

Fees already paid for examination cannot be refunded to candidates failing to pass the examination or to those disqualified under the provisions of Article 9.

ART. 9.—Where the Qualifying Examination Committee for Operators of Private Wireless Telegraphs have detected false statements in a form of antecedents or improper behaviour during examination, they will disqualify the candidate concerned.

Where the facts of a case coming under the provision of this Article are discovered after the candidate has passed the examination, his certificate of eligibility will be invalidated.

ART. 10.—The names of successful candidates will be announced in the *Official Gazette*.

ART. 11.—Where the holder of a certificate of eligibility has changed his name or lost or damaged his certificate, he may apply to the Minister of Communications for a revision or renewal thereof.

Applicants under this provision must pay a fee of thirty sen for revision or renewal of certificate affixing to the letter of application a revenue stamp for the amount.

Additional Regulation.

This Ordinance comes into force on November 1st, 1915.

(Form No. 1.)

Certificate of Eligibility awarded on Qualifying Examination for Operators of Private Wireless Telegraphs.

Name ....
Address ....
Date of birth ....
Eligible for Class No. ....

This is to certify that the above-named is qualified in the class designated in accordance with the Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs.

Name (seal) ....
President of Qualifying Examination Committee for Operators of Private Wireless Telegraphs.

Date ....

The certification of the President of the Qualifying Examination Committee for Operators of Private Wireless Telegraphs is sanctioned and a certificate of eligibility hereby granted.

(This certificate of eligibility falls within the category of Class A (B) certificates under the provisions of the Regulations relating to Business annexed to the International Wireless Telegraph Convention of London, and the holder of this certificate declares his acceptance of the obligation strictly to preserve the secrecy or communications under the whole of the Regulations.)

(Seal) Minister of Communications.

Date ....

Notes:—

(1) On the back, in the cases of Classes I and II, appears a translation in a foreign language.

(2) The paragraph in parentheses appears in the cases of Classes I and II.

(Form No. 2.)

Memorandum (on Mino paper).

Form of Application for Qualifying Examination for Operators of Private Wireless Telegraphs.

Affix Revenue Stamp here.	Name of applicant .... Address .... Date of birth .... Class qualifying for : No. ....

I am desirous of undergoing {examination to / review by examiners to} qualify for the above Class in accordance with {the provisions of the / Article 4 (or 5) of the} Regulations relating to Qualifying Examinations for Operators of Private Wireless Telegraphs, and append the documents required by Article 7 of the same Regulations.

Name (seal) ....
Present address ....
Date ....

To the Minister of Communications.

(Form No. 3.)

Memorandum (on Mino paper).

Statement of Antecedents.

Name ....
Social status and domicile ....
Date of birth ....
Education :—
School ...... Section ...... Date of entry ......

School ...... Section ...... Date of completion of studies, graduation, or leaving school .... (abstract of graduation certificate or certificate of study appended).

Occupation :—

Government office or private firm (fill in name)...... Date of entry.... Occupation followed (references from the Government office [or firm] appended)........

Awards or penalties :—

Description .... Date ....

The above is a correct statement.

Name (seal) ....

Present address ....

Date ....

Note.—A detailed statement of matters relating to telegraphy or wireless telegraphy is required. Attention is directed to the following points :

(1) The applicant's name must be inscribed on the photograph.

(2) The revenue stamp must not be cancelled.

REGULATIONS REGARDING THE QUALIFICATIONS OF WIRELESS OPERATORS.

The following Regulations regarding the qualifications of wireless operators have been issued from the Department of Communications :—

(i) Substitution of Foreign Operators.
(ii) Qualification of Wireless Operators on Fishing Trawlers.
(iii) Amendment to the Regulations regarding Qualifying Examination for Operators of Private Wireless Telegraphs.

I.—FOREIGN OPERATORS MAY BE SUBSTITUTED.

In order to prepare against possible instances where wireless operators on board Japanese ships for the service to foreign ports will be unable to attend their duties because of sickness and other inevitable circumstances, 1st and 2nd class foreign operators having certificate for the license of A or B category may be employed as substitutes to Japanese operators, subject to the approval of the Minister of Communications, in consequence of the putting the compulsory wireless regulations into effect in England. In case of application for the employment of foreign operators under the foregoing paragraph, certificates will be given them by the Ministry of Communications. Aboard ships employing foreign operators an office for public communications in foreign languages may be opened.

II.—QUALIFICATION OF WIRELESS OPERATORS ON FISHING TRAWLERS.

In view of the fact that the wireless equipment aboard fishing trawlers will not only facilitate the safety of their voyage and immediate relief from accidents, but will also be a great advantage for the fishing industry by signalling the presence of swarms of fish and other discoveries to companion ships, it is no longer uncommon for trawlers and smaller crafts to be equipped with wireless apparatus. Hitherto, however, only 1st class operators have been admitted to engage in the wireless service on these ships, which has proved to be quite inadequate. The regulations are now amended to the effect that 2nd class operators will henceforth be admitted



as senior operators on the ships carrying on the wireless service in Japanese language. In view of the actual importance, certificate of the license as 2nd class operator will be granted by the Ministry of Communications to those having practical experience in wireless communications in the Navy and other establishments.

III.—Amendment to the Regulations regarding Qualifying Examination as Wireless Operators for Private Establishments.

In view of the growing increase of applicants for the license as wireless operators in private establishments, the Regulations regarding the qualifying examination are amended as follows:

(a) Instead of the names of applicants, their number will be written in examination papers.

(b) The result of the examination will be announced in each subject on the day of its examination for the purpose of selection and dispensing with further trouble with the rest of the examination.

(c) Wireless experts in the Army and Navy will also be included in the examining committee.

JUGO-SLAVIA

(See map on page 369.)

THIS country was formed by the fusion, under the terms of the European Peace Treaty, of Servia, Montenegro, and the provinces of Bosnia and Herzegovina, which were annexed by Austria in 1908.

Conditions are not sufficiently settled in this territory for us to be able to obtain much information in regard to radiotelegraphy therein, but the annexed map will show the position of the existing wireless stations, and we hope that by the time our next volume is issued that some further particulars concerning the organisation and administration of wireless telegraphy will be available.

KENYA COLONY AND PROTECTORATE

THE territory covered under the above title extends from the Umba to the Juba River, and inland as far as the borders of Uganda. It includes the mainland dominions of the Sultan of Zanzibar (these having been leased to Great Britain for an annual rent).

The Administration is conducted by a Governor and Commander-in-Chief, assisted by an Executive and a Legislative Council.

CONTROL.

Officials Controlling Wireless Telegraphy.

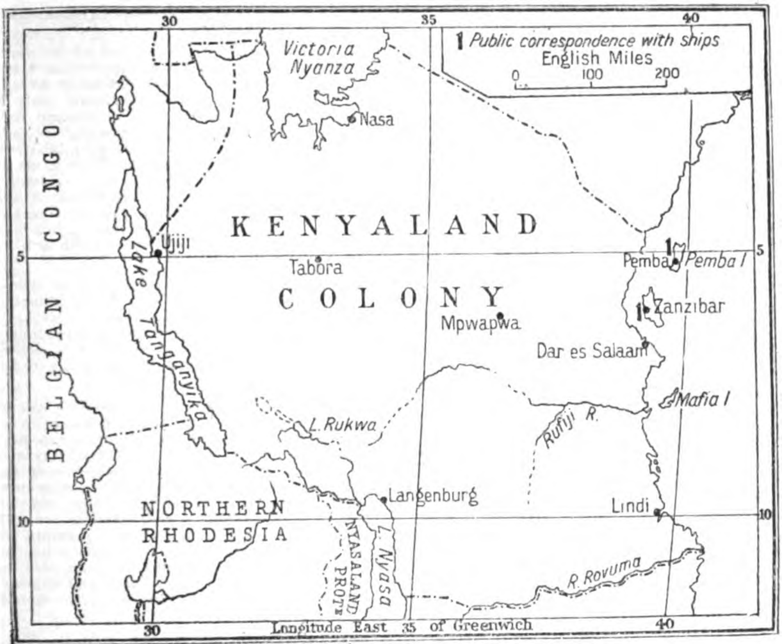
Official.	*Title.*	*Address.*
Mr. J. Gosling	Postmaster-General	Nairobi.
Mr. J. K. Creighton	Telegraph Engineer	Nairobi.
Mr. H. J. W. Ridley	Assistant Telegraph Engineer	Mombasa.
Mr. G. F. Ball	Wireless Telegraph Engineer	Kismayu.
Mr. A. Kane	Do. Do.	Nairobi.
Mr. J. Gomall	Do. Do.	Kismayu.
Mr. G. E. Hughes	Do. Do.	Mombasa.
Mr. F. Wrigglesworth	Do. Do.	Mombasa.

ORGANISATION.

At present there are two radio stations open for public traffic in this territory—one at Mombasa and the other at Kismayu, in Jubaland, whilst the construction of a third station is contemplated.

The Mombasa station is equipped with a 5 kilowatt synchronised spark, with a spark frequency of 600 per second. The note emitted is pure musical and somewhat high. This plant is only used when the state of the atmosphere will not permit the small plant to be used, the particulars of which are as follows:—

A 1½ kilowatt synchronous direct-coupled plant capable of transmitting to ships a distance of 350 nautical miles. The usual frequency of the dis-



charger is 750 per second, which has been found to give the best results in this locality.

The Kismayu station is equipped with a 3 kilowatt synchronous spark set having a frequency of 600 per second.

A radio service is maintained with Mombasa as a means of communication with Jubaland.

At present there are no private or experimental stations in the territory, neither have any licenses been issued for ship stations registered therein. An aerodrome is in contemplation for Kisumu on the shores of Victoria Nyanza.

ADMINISTRATION.

Radiotelegraphy is administered under the following :—

A—Wireless Telegraphy Ordinance, 1913.

B—Experimental License issued thereunder.

WIRELESS TELEGRAPHY ORDINANCE, 1913.

A 1. This Ordinance may be cited as "The Wireless Telegraphy Ordnance, 1913."

2. The expression "wireless telegraphy" means any system of communication by telegraph as defined by the Indian Telegraph Act, 1883, without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may, whenever he shall deem it expedient to do so, license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Protectorate or on board any British ship registered in the Protectorate.

4. (1) No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place in the Protectorate or on board any British ship registered in the Protectorate except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a license in that behalf or instals or works any apparatus for wireless telegraphy without a license in that behalf he shall be liable to a fine not exceeding one thousand and five hundred rupees or to imprisonment of either description for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Attorney-General.

(2) If a Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Governor may make regulations for all or any of the following matters:—

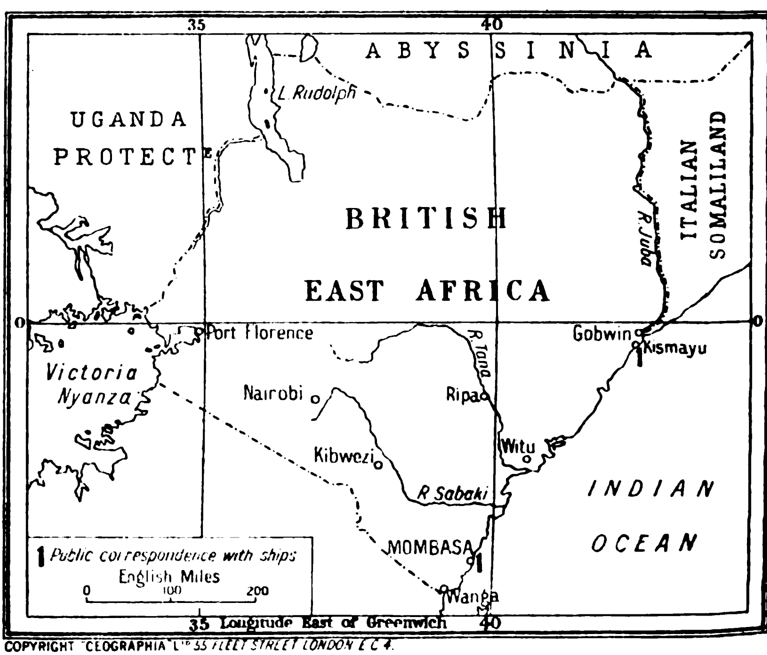
(i) for prescribing the form and manner in which applications for licenses under this Ordinance are to be made;

(ii) for prescribing the fees payable on the grant of any license;

(iii) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Protectorate shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in the Protectorate or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) for prohibiting, except with the special or general permission of the Postmaster-General of the Protectorate, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the Protectorate;

(v) for prohibiting or regulating in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Protectorate, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time and either in all classes or in such cases as may be deemed desirable.



(2) Provided that no regulations made in respect of the matters described in paragraphs (iii) (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the Governor that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy a license for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

8. (1) Every omissiom or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any Regulation made thereunder or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Ordinance and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine of seven hundred and fifty rupees.

(2) All convictions, forfeitures, and fines under this Ordinance or any Regulations thereunder may be had and recovered before a Magistrate of the first class, and every such Magistrate shall have jurisdiction to pass any sentence authorised by this Ordinance on any European or other non-Native convicted of an offence against this Ordinance nothwithstanding anything in any Ordinance or law limiting the jurisdiction of such Magistrate over Europeans and non-Natives.

9. The Wireless Telegraph Ordinance, 1908, is hereby repealed: Provided however—

(1) Every license granted under the said Ordinance and in force at the commencement of this Ordinance shall be deemed to have been granted under this Ordinance.

(2) All Regulations made under the said Ordinance and in force at the commencement of this Ordinance shall be deemed to have been made under this Ordinance and shall continue in force until other provision is made.

LICENSE.

By upon me by Section 7 of the Wireless Telegraphy Ordinance, 1913, I, Edward Northey, Major-General of His Majesty's Forces, Knight Commander of the Most Distinguished Order of Saint Michael and Saint George, Companion of the Most Honourable Order of the Bath, Governor and Commander-in-Chief of the Colony of Kenyaland and the East African Protectorate, do hereby license and authorise

In exercise of the powers conferred

residing at

to conduct experiments in wireless telegraphy and for such purpose to import Wireless Telegraph apparatus and instal the same at such places as the Postmaster-General shall approve subject to the conditions and restrictions following, that is to say:—

1. All apparatus utilised pursuant to the provisions of this license shall be used solely for the purpose of scientific study in wireless telegraphy and in no case shall the licensee instal apparatus capable of being used for the purpose of sending wireless signals, or use the receiving apparatus for the purpose of receiving either private messages or for any commercial telegraph traffic whatsoever.

2. This license shall remain in full force and operation for from date hereof.

Given under my hand at Nairobi this day of 1920.

Governor and Commander-in-Chief.

KOREA

(See JAPAN.)

KWANTUNG

(See JAPAN.)

LADRONE ISLANDS

(See map on p. 146.)

LATVIA

(See map on p. 418.)

THIS State, alternatively known under the appellation Lettland, has only recently gained its independence, having been formed out of the erstwhile Russian Empire. The country constitutes that part of the territory lying immediately around the Gulf of Riga.

CONTROL.

The control of wireless telegraph operations is at present under the direction of the Military Commandant.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Captain John Asars	Chief Administrator	Riga
2nd-Lieut. Rudolf Kurzemneeks ..	Assistant to Chief Administrator..	Riga
Lieut. Oscar Vallentshuks	Chief of Riga Station	Riga
2nd-Lieut. Alfred Veilands	Chief of Libau Station	Leepaja (Libau)
Sgt.-Maj. William Hansmans ..	Chief of Windau	Ventspils (Windau)

ORGANISATION.

In view of the termination of the wars with Russia and Germany it is expected that the coast stations at Riga (KCH) and Libau or Leepaja (KCB) will soon be open for public correspondence.

The following stations are at present in operation: Riga, Leepaja or Libau, Ventspils or Windau, and a receiving station at Riga Castle. Also a number of Army field and aviation stations. There are no ship stations at present in use.

ADMINISTRATION.

It is expected that Latvia will soon be admitted to the International Radiotelegraphic Convention, and to this end Laws and Regulations are in course of preparation. The Bureau of Berne has already allotted the call letters KCA to KCZ.

At the moment the Constitutional Assembly is occupied with discussion of the constituency, but attention will be given at the earliest moment to wireless telegraphy and its development in Latvia.

LEEWARD ISLANDS

THE Leeward Islands consist of the five Presidencies of: (1) Antigua with Barbuda and Redonda; (2) St. Kitts and Nevis with Anguilla; (3) Dominica; (4) Montserrat; and (5) The Virgin Islands with Sombrero. The Colony is under one Governor who resides at Antigua. The Presidencies of St. Kitts and Dominica are under Administrators and the Presidencies of Montserrat and the Virgin Islands under Commissioners, the Administrators and Commissioners being subject to the instructions of the Governor. The administrative centre and the residence of the Governor-in-Chief is St. John's, Antigua, lying in 17° 6′ N. latitude, 61° 45′ W. longitude.

ADMINISTRATION.

No wireless stations exist, but wireless telegraphy would be administered under:—

A—Ordinance No. 11, 1913.
B—Regulations made thereunder in 1913, and
C—Further Regulations dated 28th August, 1917.

Similar legislation is in force in the other islands under the same administration.

ANTIGUA, NO. 11 OF 1913.

An Ordinance to consolidate and amend the law relating to wireless telegraphy.

Be it ordained by the Governor and Legislative Council of Antigua as follows:

1. This Ordinance may be cited for all purposes as "The Wireless Telegraphy Consolidation Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor-in-Council.

(2) Every such license shall be in such form and for such period as the Governor-in-Council may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. No person shall work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Presidency, otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor-in-Council may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time in the opinion of the Governor-in-Council an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in territorial waters of the Presidency shall be subject to such further regulations as may be made by the Governor-in-Council from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place, or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under this Ordinance, he may grant a search warrant to any Police Officer or any person appointed in that behalf by the Chief Inspector of Police and named in the warrant, and a warrant so granted shall authorise the Police Officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person guilty of an offence against any provisions of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings under this Ordinance shall be taken on the complaint of the Chief Inspector of Police or of any person thereto authorised by him in writing.

8. Ordinance No. 12 of 1903 entitled "An Ordinance to regulate the establishment of Wireless Telegraphy" and Ordinance No. 7 of 1913 entitled "An Ordinance to amend the Wireless Telegraphy Ordinance, 1903," are hereby repealed.

Passed the Legislative Council the 14th day of October, 1913.

Dated at Antigua the 23rd day of October, 1913, in the fourth year of His Majesty's reign.

SCHEDULE—Section 5 (2).

REGULATIONS.

B

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Presidency shall be worked in such a way as not to interfere with

(*a*) Naval signalling, or

(*b*) the working of any wireless telegraph station lawfully established, installed or worked in the Presidency or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Presidency except with the special or general permission of the Governor-in-Council.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

REGULATIONS.

Made by the Governor-in-Council.

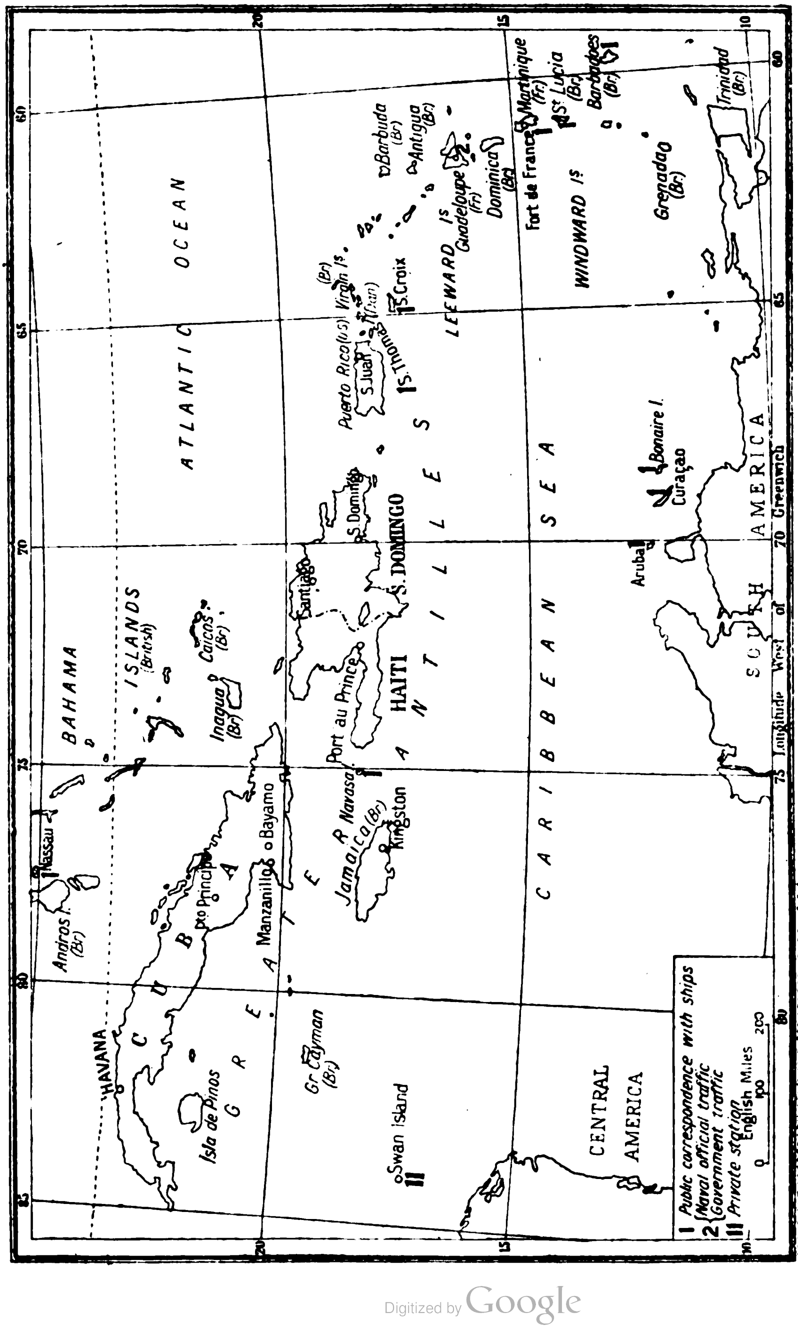
C

Whereas it is provided by section 5 (3) of the Wireless Telegraphy Consolidation Ordinance, 1913, that if at any time, in the opinion of the Governor-in-Council, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships while in the territorial waters of the Presidency shall be subject to such further regulations as may be made by the Governor-in-Council from time to time; and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

And whereas in my opinion such emergency as aforesaid has arisen:

Now I do hereby rescind the further Regulations made under the said Ordinance on the 8th day of September, 1914, and make the following Regulations, namely:—

1. The radiotelegraph stations on board ships (other than ships requisitioned by His



Port-au-Prince open for public general correspondence.

Majesty's Government) shall not be worked whilst such ships are within a harbour of the Presidency and for the proper enforcement of the above.

(*a*) Ships of British register in harbours of the Presidency must completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show that they are properly disconnected.

(*b*) Ships of foreign register in a harbour of the Presidency must, subject to the provisions of the following sub-sections (*c*) take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus.

(*c*) Ships of foreign register remaining in the harbour of the Presidency for less than twelve hours may at the discretion of the Governor be permitted to leave their aerials up, provided the same are disconnected in accordance with the provisions of sub-section (*a*) of this Regulation.

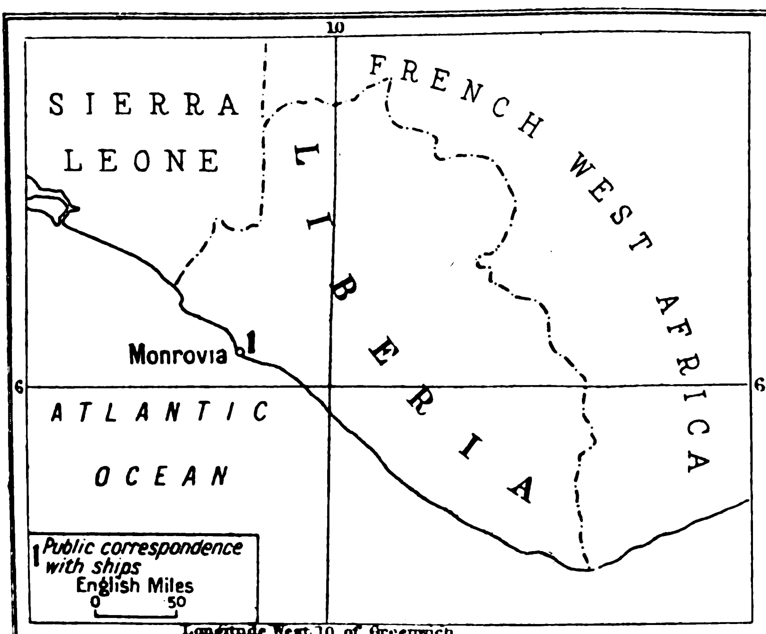
2. The Governor may at his discretion direct that the operating room of any ship (other than a ship requisitioned by His Majesty's Government) in a harbour of the Presidency be sealed or order any other steps to be taken affecting the radiotelegraph station on board any such ship.

3. Every person failing to obey and conform with the provisions of these Regulations or with any directions given by the Governor under the same shall be guilty of an offence and shall be liable on summary conviction to the penalties under the Ordinance provided.

Made by the Governor-in-Council, under section 5 (3) of the Wireless Telegraphy Consolidation Ordinance, 1913, this 28th day of August, 1917.

LIBERIA

THE only independent "black" republic in the Old World, owes its inception (in 1847) to an effort on the part of American and European slave emancipators to found a country for freed negro slaves in the continent which formed the original home of the race. It lies on the west coast of Africa, approximately between 5° and 10° N. latitude and 7° and 11° W. longitude, possessing about 350 miles of coast line. The executive authority is vested in a President, a Vice-President, and a Council of six Ministers, and



the legislative power in a Parliament of two Houses, known respectively as the Senate and House of Representatives.

Wireless telegraphy is represented by a station situated at Monrovia, under the jurisdiction of the French Government, which is open for public correspondence with ships.

LUXEMBOURG

(See map on p. 260.)

THIS small Grand Duchy lies roughly about 150 miles from the nearest sea coast, and is bounded on the east by Germany, on the south by France, and on the west by Belgium. Formerly (from 1815 to 1866) it formed part of the now dissolved Germanic Confederation, but under the terms of the Treaty of London, dated 11th May, 1867, it is declared neutral territory, and its integrity and independence guaranteed. The country is governed by a Chamber of Deputies of 48 members, elected for six years, with half renewed every three years. Its total area is about 1,000 square miles, and it possesses a population of about 260,000.

ORGANISATION.

A receiving wireless telegraph station has been erected by the State at the capital city of Luxembourg, with the object of receiving daily French Official Time and Meteorological information.

ADMINISTRATION.

No law fixing conditions under which wireless apparatus may be installed is in existence, although a certain number of amateurs are in possession of receiving apparatus.

The Grand Duchy of Luxembourg has not adhered to the London Radiotelegraphic Convention ; it has, however, made a declaration to the Berne Bureau in accordance with Article 48 of that Convention.

MADAGASCAR

(See FRANCE.)

MALAYA

(See map on p. 146.)

Comprising (1) The Federated Malay States ;
(2) Malay States not included in the Federation.

(1) Federated States.

THE first division under which the component parts of Malaya are grouped consists of the Federated States. They lie on the mainland of the Malay Peninsula, and are closely connected with the Straits Settlements. They comprise the States of Perak, Selangor, Negri Sembilan, and Pahang, which have by a Treaty dated 1895 renewed their arrangements with the British Government. They are administered under the advice of a Chief Secretary with residents in each State, subject to the instructions of the High Commissioner, who is also Governor of the Straits Settlements, and resides at Singapore. The Chief Secretary to the Government is located at Kuala Lumpur. Their total area amounts to 27,506 square miles.

There are two wireless stations open for public service with ships and one for Government traffic only.

ADMINISTRATION.

Wireless telegraphy is regulated by :—

A—Enactment No. 7 of 1913, and

B—Rules under the above Enactment.

The text of both the enactment and the rules made under its provisions will be found below.

ENACTMENT NO. 7 OF 1913.

An Enactment to make better provision for the regulation of Wireless Telegraphy.

July 30th, 1913.

It is hereby enacted by the Rulers of the Federated Malay States in Council as follows :—

1. (1) This enactment may be cited as "The Wireless Telegraphy Enactment, 1913," and shall come into force upon the publication thereof in the *Gazette*.

(2) The Enactments specified in the schedule are amended by deleting from the interpretation of "Telegraph" in section 2 of each of the said Enactments the words "whether worked with or without lines of wires."

2. (1) In this Enactment the expression "wireless telegraphy" means any system of communication by telegraph as defined by "The Telegraphs Enactments, 1905," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received ;

The expression "locally owned ship" means a ship owned wholly by the Government of the Federated Malay States or of any of them or by subjects of any of the rulers of the said States or by bodies corporate established under and subject to the laws of the said States or of any of them and having their principal place of business within the said States or by any person residing within the said States.

(2) Nothing in this Enactment shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Chief Secretary to Government may, whenever he shall deem it expedient to do so, license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Federated Malay States or on board any locally owned ship.

4. (1) No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place in the Federated Malay States or on board any locally owned ship except under and in accordance with a license granted in that behalf by the Chief Secretary to Government.

(2) Every such license shall be in such form and for such period as the Chief Secretary to Government may determine and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Chief Secretary to Government shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a license in that behalf or instals or works any apparatus for wireless telegraphy without a license in that behalf, he shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Enactment except with the previous sanction of the Public Prosecutor.

(2) If a Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf he may grant a search warrant to any police officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Chief Secretary to Government may make rules for all or any of the following matters :—

(*a*) for prescribing the form and manner in which applications for licenses under this Enactment are to be made ;

(*b*) for prescribing the fees payable on the grant of any license ;

(*c*) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, in the waters of the Federated Malay States shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the Federated Malay States or the waters thereof and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea ;

(*d*) for prohibiting except with the special or general permission of the Director of Posts and Telegraphs, Federated Malay States, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, whilst such ship is in any of the harbours of the Federated Malay States ;

(*e*) for prohibiting or regulating, in case at any time in the opinion of the Chief Secretary to Government an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether locally owned ships, British or foreign ships, in the waters of the Federated Malay States, the use of wireless telegraphy on board such ships while in such waters

by such further rules as the Chief Secretary to Government may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) No rules made in respect of the matters described in paragraphs (*c*), (*d*) and (*e*) of sub-section (1) shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the Chief Secretary to Government that the sole object of obtaining the licence is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted subject to such special terms, conditions, and restrictions as the Chief Secretary to Government may think proper, but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Enactment or of any rule made thereunder or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Enactment and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any articles seized, be liable to a fine not exceeding five hundred dollars.

(2) All convictions, forfeitures and fines under this Enactment or any rules made thereunder may be had and recovered before the Court of a Magistrate of the First Class.

SCHEDULE.

State.	No. and year.	Short title.
Perak ..	6 of 1905	The Telegraphs Enactment, 1905
Selangor ..	9 ,,	,, ,,
Negri Sembilan	7 ,,	,, ,,
Pahang ..	8 ,,	,, ,,

RULES.

UNDER "THE WIRELESS TELEGRAPHY ENACTMENT, 1913."

By In exercise of the powers vested in him by section 6 of "The Wireless Telegraphy Enactment, 1913," the Chief Secretary to Government has made the following rules:—

1. All apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, in the waters of the Federated Malay States shall be worked in such a way as not to interfere with (*a*) naval signalling or (*b*) the working of any wireless telegraph station lawfully established installed or worked in the Federated Malay States or the waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. (i.) No apparatus for wireless telegraphy on board a merchant ship, whether a locally owned ship, a British or a foreign ship, shall be worked or used whilst such ship is in any of the harbours of the Federated Malay States.

(ii.) To ensure the proper enforcement of paragraph (i.) of this rule—

(*a*) Locally owned ships and British ships in harbours of the Federated Malay States shall completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show that they are properly disconnected.

(*b*) Foreign ships in harbours of the Federated Malay States shall take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus; provided that foreign ships remaining in a harbour of the Federated Malay States for less than twelve hours may, at the discretion of the Harbour Master or other competent local authority, be permitted to leave their aerials up, if the same are disconnected in the manner described in the last preceding clause;

(*c*) The operating room of any locally owned or British or foreign ship shall, in any case where the Harbour Master or other competent local authority so directs, be sealed up and kept sealed up while such ship is in a harbour of the Federated Malay States, and such other steps may be taken as to the Harbour Master or other competent local authority seem expedient.

3. If at any time, in the opinion of the Chief Secretary to Government, an emergency has arisen in which it is expedient for the public service that the Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships, whether locally owned ships, British or foreign ships, while in the waters of the Federated Malay States shall be subject to such further rules as may be made by the Chief Secretary to Government from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. Expressions defined in "The Wireless Telegraphy Enactment, 1913," have in these rules the meanings thereby assigned to them.

(2) Non-Federated States.

These comprise Johore, Kedah, Perlis, Kelantan and Trengganu. The relations of Johore with Great Britain are defined in the Treaty of 1885, amended by an agreement dated May 12th, 1914, whereby the Sultan exacts and acts upon the advice of a British officer called his General Adviser. With regard to the other four States, rights of suzerainty, administration and control were transferred by Siam to Great Britain under a Treaty dated March 10th, 1909.

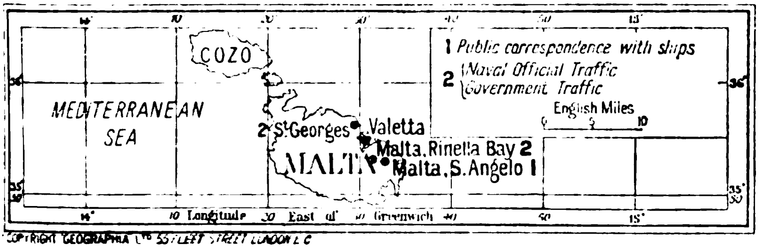
At present there are no wireless stations in these States and consequently no radiotelegraphic enactments.

MALTA

THIS island, 17½ miles long by 8¼ miles broad, forms the headquarters of the British Mediterranean Fleet and the principal coaling station for merchant vessels, as well as the Navy, in the Mediterranean. The language of the people is a corrupt dialect of Arabic. The Knights of St. John, who possessed the island from 1530 to 1798, raised the stupendous fortifications which rendered Malta so long militarily formidable. The island was finally recognised as a British dependency by the Congress of Vienna in 1814, and is ruled by a Governor, assisted by an Executive Council and a "Council of Government." In 1920 a partial measure of home rule was adopted.

CONTROL AND ORGANISATION.

The administration of wireless telegraphy in Malta and its dependencies is under Naval control. There are three stations, one of which is open for public service to ships.



ADMINISTRATION.

Wireless telegraphy in the Colony is administered under the provisions of Telegraph Ordinance No. I of 1904, as amended by Telegraph Ordinance No. III of 1909, but wireless telegraphy is not specifically mentioned in either, and they are therefore not printed here. Regulations under these Ordinances have been made by His Excellency the Governor and are reprinted in full below.

A—Government Notice No. 258 of December 24th, 1909.
B—Section 28, Malta Defence Regulations.

GOVERNMENT NOTICE, No. 258.

A It is hereby notified for general information, that His Excellency the Governor, in exercise of the powers vested in him by Article 41 of Ordinance No. I of 1904, as amended by Ordinance No. III of 1909, has been pleased to make the following regulations respecting the use of wireless telegraph apparatus on merchant ships, whether British or foreign, while in the territorial waters of these Islands.

By command, E. P. S. ROUPELL,
Acting Lieutenant-Governor and Chief Secretary to Government.

Lieut.-Governor's Office, The Palace, Valetta,
December 24th, 1909.

REGULATIONS RESPECTING THE USE OF WIRELESS TELEGRAPH APPARATUS ON MERCHANT SHIPS, WHETHER BRITISH OR FOREIGN, WHILE IN THE TERRITORIAL WATERS OF MALTA AND ITS DEPENDENCIES.

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of these Islands shall be worked in such a way as not to interfere with—

(a) Naval signalling; or
(b) the working of any wireless telegraph station lawfully established, installed or worked in these Islands or the territorial waters thereof;

and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of these Islands, except with the special or general permission in writing of the Lieutenant-Governor.

3. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that the Government shall have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships whilst in the territorial waters shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

SECTION 28, MALTA DEFENCE REGULATIONS.

B PROHIBITION AGAINST POSSESSION OF WIRELESS TELEGRAPHIC APPARATUS, ETC.

No person shall, without the written permission of the Governor, make, buy, sell, or have in his possession or under his control any apparatus for the sending or receiving of messages by wireless telegraphy, or any apparatus intended to be used as a component part of such apparatus; and no person shall sell or give any such apparatus to any person who has not obtained such permission as aforesaid, and any person having in his possession or under his control any such apparatus, whether with or without the permission of the Governor, shall on demand deliver the apparatus to the Governor, or as he may direct; and if any person contravenes the provisions of this regulation he shall be guilty of an offence against these regulations.

Where it appears to the Governor that there are reasons to suspect that any person having in his possession any apparatus for sending or receiving messages by telegraphy, wireless telegraphy, telephony or other electrical or mechanical means is using or about to use the same for any purpose prejudicial to the public safety or the defence of these Islands, he may, by order, prohibit that person from having any such apparatus in his possession, and may take such steps as are necessary for enforcing the order, and if that person subsequently has in his possession any apparatus in contravention of the order, he shall be guilty of an offence against these regulations.

For the purpose of this regulation, any apparatus ordinarily used as a distinctive component part of apparatus for the sending or receiving of messages by wireless telegraphy shall be deemed to be intended to be so used unless the contrary is proved.

Any person possessing private telephone installations or any apparatus capable of being used for transmitting telephone messages shall give notice to the Superintendent of Police of any such installation or apparatus, and if he fails to do so he shall be guilty of a summary offence against these regulations.

MARIANNE ISLANDS

(See map on p. 146.)

MARSHALL ISLANDS

(See map on p. 424.)

MARTINIQUE

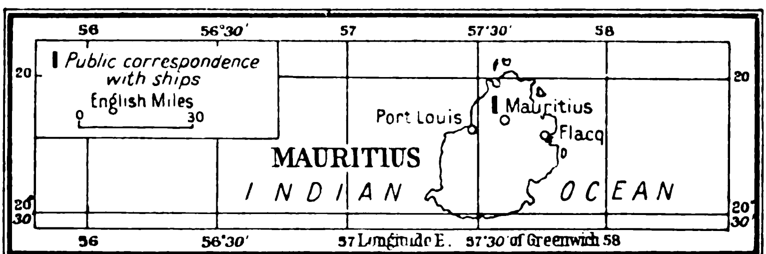
(See FRANCE.)

MAURITIUS

MAURITIUS lies in the Indian Ocean, 500 miles east of Madagascar, and comprises a total area of about 720 square miles.

The Colony was formerly ceded to Great Britain by the Treaty of Paris of 1814. Under letters patent of 1885, 1901, 1904, and 1912 partially representative institutions have been granted. The Administration of the Colony and its dependencies is vested in a Governor, assisted by an Executive Council and a Council of Government.

It possesses but one wireless installation, which was closed for general use in July, 1920. The question of its being taken over by the local government is under consideration. Cyclone warnings are issued to ships from this station.



ADMINISTRATION.

The legislation affecting Wireless Telegraphy in Mauritius was originated by an Ordinance (No. 33) issued in 1903 investing the Governor with certain administrative powers. This was amended by the "Wireless Telegraphy"

(Amendment) Ordinance (No. 25) of 1912. These have since been consolidated by Ordinance No. 11 of 1913, and three sets of Regulations have been framed thereunder, as follows :—

A—Ordinance No. 11 of August 22nd, 1913 (to Consolidate the Laws on Wireless Telegraphy).

B—Regulations framed under Ordinance No. 11 of 1913 (Art. 4) (August 22nd, 1913).

C—Additional Regulations respecting the transmission of messages by Wireless Telegraphy.

D—Regulations governing the transmission of messages by Wireless Telegraphy through Rose Belle Station to and from Merchant Ships at sea.

A

ORDINANCE No. 11.

August 22nd, 1913.

Be it Enacted by the Governor, with the advice and consent of the Council of Government, as follows :—

1. *Definition of "Wireless Telegraphy."*—In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received; Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

2. *License for "Wireless Telegraphy."*—(1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

3. *Apparatus aboard ships.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

4. *Regulations.*—(1) The Governor in Executive Council may from time to time make regulations for carrying into effect the purposes of this Ordinance.

(2) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

5. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a licence in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any licence granted under this Ordinance he may grant a search warrant to any police officer or any person appointed in that behalf by the Inspector-General of Police and named in the warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. *Penalties.*—Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable to a fine not exceeding five hundred rupees (Rs. 500) and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

7. *Repeal Clause.*—Ordinances No. 33 of 1903 and 25 of 1912 are repealed.

8. *Short Title.*—This Ordinance may be cited as "The Wireless Telegraphy (Amendment) Ordinance, 1913."

Passed in Council at Port Louis, Island of Mauritius, this twenty-ninth day of July, One thousand nine hundred and thirteen.

B

REGULATIONS FRAMED UNDER THE WIRELESS TELEGRAPHY ORDINANCE No. 11 OF 1913 (ARTICLE 4).

1. Apparatus for wireless telegraphy on board a merchant ship shall not be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

2. Apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall not be worked in such a way as to interfere with

(*a*) Naval signalling, or

(*b*) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

3. In these regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval

station and any other wireless telegraph station whether on shore or on any ship.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. Any person who shall offend against any of these Regulations shall be liable to a fine not exceeding five hundred rupees (Rs. 500), and any apparatus for wireless telegraphy in connection with which the offence was committed may be seized and forfeited.

8. The Regulations published under Government Notification No. 19 of January 25th, 1913, are hereby repealed.

Made by His Excellency the Governor in Executive Council at a meeting held on August 22nd, 1913.

C ADDITIONAL REGULATIONS RESPECTING THE TRANSMISSION OF MESSAGES BY WIRELESS TELEGRAPHY.

(Made under Article 4 of the Wireless Telegraphy Ordinance No. 11 of 1913.)

1. Telegrams for transmission to ships at sea will in all cases be held at the Wireless Station until the ship in question arrives within range, *i.e.*, telegrams will not be transmitted to a ship which is approaching the Island until she has called the wireless station for the first time.

2. In the case of a ship going away from the Island the telegram will be transmitted immediately on receipt at the wireless station unless she is known to have already passed out of range. In this case and in all cases where the transmission of the telegram by wireless proves to be impossible, the sender will be informed by service advice from the post office at which he handed in his telegram, and will be refunded the wireless charges.

Made by the Governor in Executive Council at a meeting held on the twenty-sixth day of December ,1919.

D REGULATIONS GOVERNING THE TRANSMISSION OF MESSAGES BY WIRELESS TELEGRAPHY THROUGH ROSE BELLE STATION, TO AND FROM MERCHANT SHIPS AT SEA.

(Made under Article 4 of the Wireless Telegraphy Ordinance No. 11 of 1913.)

1. Messages received by wireless telegraphy from merchant ships at sea will be handed in at Rose Belle Post Office by an officer or agent of the wireless station and will be transmitted to any of the telegraph offices of the Colony for delivery to the addressee subject to the following conditions and charges :—

(*a*) A terminal charge will be made at the rate of R. 0.02 cents. of a rupee per word.

(*b*) The usual end porterage charges from the post office of destination to the addressee will be made.

2. Messages for transmission to merchant vessels at sea will also be accepted at any of the telegraph offices in the Colony subject to the following conditions and charges :—

(*a*) The charge for messages shall be at the rate of 62 cents. of a rupee per word.

(*b*) The charge for porterage from Rose Belle Post Office to the wireless station shall be 50 cents. of a rupee.

(*c*) Every message shall bear the supplementary word "wireless" for which a charge of 2 cents. of a rupee will be made.

3. The rules and regulations for the acceptance and transmission of messages by wireless telegraphy shall be in accordance with the rules and regulations of the Mauritius Post Office and Telegraphs for the time being in force.

4. Messages in code will not be transmitted or received by wireless telegraphy.

5. Regulations published under Government Notices No. 94 of 31st May, 1919, and No. 47 of 25th February, 1920, are repealed.

Made by the Governor in Executive Council, at a meeting held on the ninth day of July, one thousand nine hundred and twenty.

MEXICO

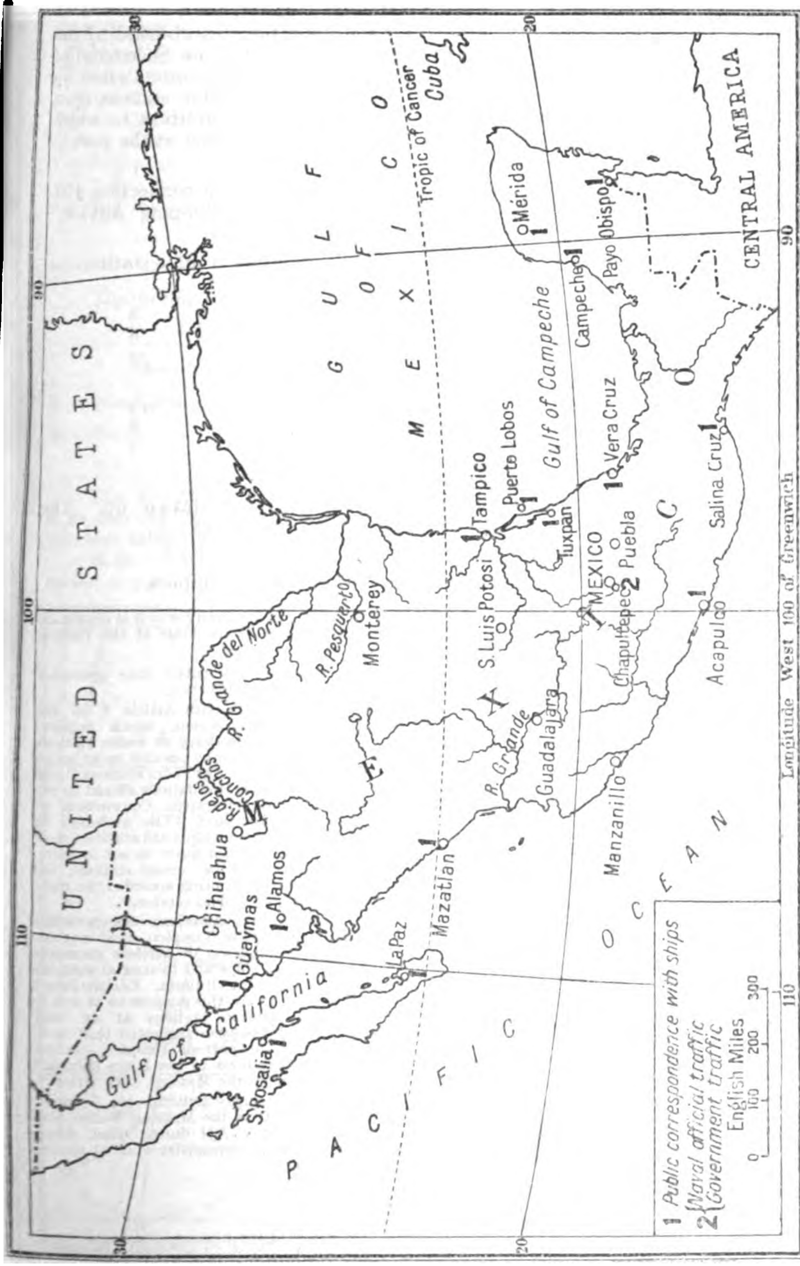
MEXICO occupies an important position in the southern part of the continent of North America, and is bounded on the north by the United States of America, and by Guatemala and British Honduras on the south. It lies approximately between 15° and 30° 30′ north latitude and 87° and 117° longitude east of Greenwich. It is divided into twenty-eight states, two provinces (territorio), and a federal district.

CONTROL.

The wireless service is worked exclusively by the Federal Government, presided over by the Secretariat of Communications and Public Works. The direct control is in the hands of the Technical Department of the Dirección General de Telégrafos Nacionales.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
Sr. M. Mendez	Director-General of National Telegraphs ..	Mexico City



Isla Maria Madre open for public general correspondence.

ORGANISATION.

Private installations are allowed on the conditions established by the Dirección General de Telégrafos Nacionales authorised by the Secretariat of Communications and Public Works as long as the Decree promulgated on October 19th, 1916, is not violated. The radiotelegraphic stations open for public service to ships are fourteen in number, in addition to which we may include the installation which was recently completed at the port of Salina Cruz.

There are at present no radiotelegraphic arrangements in connection with aviation. Time and weather signals combined with "Shipping Advice" services are sent out from the coastal wireless stations daily.

The following are the particulars relating to radiotelegraphic stations :—

Radio Land Stations.	
Pacific Coast	8
Mexican Gulf Coast	8
Interior	10
Radio Ship Stations.	
Merchant ships	11
Naval ships	8
Lighthouse guard ship	1

ADMINISTRATION.

A National Radiotelegraphic Law has not yet been drawn up. The only extant decree relative to radiotelegraphy runs as follows :—

A—Decree of October 19th, 1916.

B—Use of Wireless Apparatus at the Port of Tampico.

A ART. I.—The establishment and exploitation of Radiotelegraphic Stations is forbidden in the Mexican Republic except under the express authorisation of the Federal Government, which can only accord it on the terms and under the conditions which are contained in the Regulations attached to the said Law.

ART. II.—Anyone who without the authorisation of the Federal Government establishes a Radiotelegraphic Station shall be liable to a penalty of 500-1,000 pesos, or imprisonment from 1 to 11 months, or shall suffer a combination of both penalties in accordance with the seriousness of the offence. Moreover, all apparatus, machines, and accessories forming part of the installation shall be sequestrated for the benefit of the State.

ART. III.—If any corporation which instals a Radiotelegraphic Station be a company or any other responsible body, direct responsibility with regard to the infraction of this law is vested in the person of the directors, agents or administrators.

ART. IV.—Any persons who make use of a Radiotelegraphic Station installed without the authorisation of the Federal Government shall be liable to a punishment of half the penalty enacted in ART. II preceding.

ART. V.—Any persons who make use of a Radiotelegraphic Station without the authorisation of the Federal Government, or who intercept a communication between Public Departments, or who divulge its contents, shall be liable to the penalty which is contained in ART. 770 of the Penal Code of the Federal District.

ART. VI.—This Law enters into operation from the date of its publication.

B In accordance with Article 8 of the London Convention, which requires that "The working of radio stations shall be organised as far as possible so as not to disturb the working of other radio stations," and Article XLVI, Service Regulations affixed to the International Radiotelegraphic Convention of 1912, which requires that "The exchange of correspondence between shipboard stations shall be carried on in such a manner as not to interfere with the service of the coastal stations, the latter, as a general rule, being accorded the right of priority for the public service."

It is notified that American vessels when anchored in the port of Tampico, must not engage in the transmission of wireless messages to other American ships and to coastal stations in the United States at all times. Certain hours have been set apart for this purpose so as not to inconvenience Mexican stations at or near Tampico, and it has been requested that such vessels, while in the port of Tampico, confine their wireless operations to the hours specified for that purpose by the Mexican authorities.

Operators on ships arriving at Tampico should ascertain from the Mexican Radio Station at that port (XAJ) during what hours they may use their transmitter while at anchor in the harbour.

MONTSERRAT

(See LEEWARD ISLANDS.)

MOROCCO

KNOWN to the natives as " Maghreb-el-Aksa " (the farthest west), Morocco is an empire sometimes spoken of as the Mauritanian Quadrilateral. It lies in North West Africa between Algeria on the east and the Atlantic Ocean on the west, and is bounded on the north by the Mediterranean and on the south by the Sahara Desert. The language of the country is a dialect of Arabic, and the majority of its inhabitants are Moslems. By the Conference of Algeciras, held in 1906, France and Spain agreed to organise the police force and customs of the coast towns, whilst the internal government of the country lies mainly in the hands of the Sultan and his advisers.

(a) French Zone.

CONTROL.

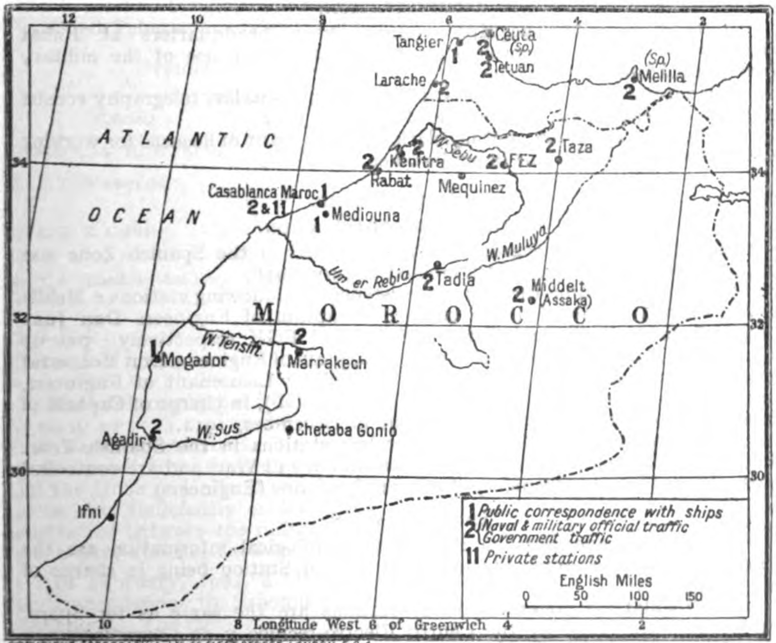
The present arrangements are as follows :—

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
M. le Colonel Apiano ..	Directeur du Service des Communications..	Résidence Général Rabat.
M. Walter	Directeur de l'Office des Postes Télégraphes et Téléphones	Résidence Général Rabat.

The Directeur du Service des Communications at the Residency General is in control, through a controlling station at the Residency General, of all wireless telegraph stations, Civil, Military, and Naval, in the French zone.

N.B.—This control station is not the same as the Rabat Station CNF which is now abolished.



ORGANISATION.

The question of establishing wireless telegraph stations in Morocco first arose in 1906, when the Shereefian Government decided to erect several stations. A company was formed at Tangier, called the Société Internationale de la Télégraphie Sans Fil, which received the concession to instal the service. Its director was M. Henri Popp, a French engineer. The company did not exist long, however, for in 1908 the Shereefian Government bought it out, M. Popp remaining as manager and chief engineer.

The first stations to be established were Tangier and Casablanca, in 1907. Next came Rabat, in 1908, and Mogador at the end of the same year.

In 1910 M. Popp died, and was succeeded by M. Biarnay, under whose direction the Fez station was established during the summer and autumn of 1911. Since then the Shereefian Government has created no further stations. The French Military Authorities, however, have stations all over the French Zone, including one at Agadir. Portable military wireless telegraphy installations have been in use by French mobile columns since 1911.

The present organisation consists of the Shereefian Government stations at Tangier and Casablanca. These are for public use, the stations at Fez, Mequinez, Darrakech, Agadir, and others, being solely for military use. The station at Deduina is to be used only for the transmission of public and official urgent (triple paid) messages. Wireless telegraphy in the French Zone forms a Government monopoly.

The various military and civil posts all over Morocco (French Zone) keep the Service des Communications at the Residency General informed of meteorological conditions at their several posts, and the Service des Communications also receives the Eiffel Tower, Madrid, Algiers, etc., news, and hands it on to the Aviation Militaire and the Service Météroroloqique, which is on the aviation ground at Rabat.

ADMINISTRATION.

Military wireless telegraph stations keep headquarters at Rabat informed as regards meteorological conditions for the use of the military Aeronautical Bureau.

The current Laws and Regulations governing wireless telegraphy consist of the Radiotelegraphic Convention of London, 1912.

No licenses are given, and legislation for the grant of licenses for working wireless telegraphy will not be undertaken.

(*b*) Spanish Zone.

CONTROL AND ORGANISATION.

The first wireless telegraph station installed in the Spanish Zone was that of Melilla (call letters EGB), erected in July, 1918.

At the present time there are in existence the following stations: Melilla (EGB), erected in July, 1918, in charge of Captain of Engineers Don Juan Reig Valerino; Ceuta and Tetuan (EGD and EGK respectively), put up in July, 1911, and July, 1914, in charge of Captain of Engineers Don Monserrat Fenech Munoz, Diploma of the Staff, assisted by Lieutenant of Engineers, Don Antonio Guerindiain Ponte, and Larache (EGF), in charge of Captain of Engineers Don Jesus Prieto Rincon, put in December, 1911.

These are the only permanent wireless stations in the Spanish Zone. They are all under the jurisdiction of the Ministry of War, and are controlled by the Centro Electro-tecnico y de Comunicaciones (Engineers).

ADMINISTRATION.

Existing arrangements as regards meteorological information are the same as those for Spanish Stations, the Madrid Station being in charge of this service.

The Regulations governing these stations are the same as for Spain, and licenses are given by the Centro Electro-tecnico y de Comunicaciones after the necessary examinations.

NETHERLANDS (THE)

THE Netherlands is the official name of the Kingdom of Holland, and possesses the same signification as its old English title of the "Low Countries." During the fourteenth century the Countship of Holland and Earldom of Flanders became appanages of the Dukes of Burgundy, and through them passed under Spanish rule, which, tyrannically exercised, ended in the establishment of the Netherlands Republic. At the close of the seventeenth century the Stadtholdership was revived for a time in the person of William, Prince of Orange, who became King of England. The Batavian Republic (a combination of Holland and Belgium) was established by the French at the end of the eighteenth century, and this was later converted into a Kingdom under Louis Bonaparte. The Orange family was recalled after Napoleon's fall; but Belgium seceded from the "United Kingdom" in 1830. The present Queen Wilhelmina is a scion of the House of Orange.

The eleven provinces into which Holland is divided lie between 50° 46′ and 53° 34′ N. latitude, extending from 3° 22′ to 7° 14′ E. longitude. They cover a total area of 12,761 square miles. Holland is a constitutional monarchy, the executive being vested in the King or Queen (acting through the Ministers), and the power to make laws in the King or Queen with Parliament ("Staten Generaal"). The Parliament consists of two chambers, of which the second is directly elected by the people and the first by the "Provinciale Staten." The chief commercial cities are Amsterdam and Rotterdam, the court capital and centre of administration being located at The Hague (Den Haag).

CONTROL.

Except in so far as the Navy, the Army, and the Colonies are concerned, wireless telegraphy is placed in the hands of the Director-General of Posts and Telegraphs under the supervision of the Minister of Waterways.

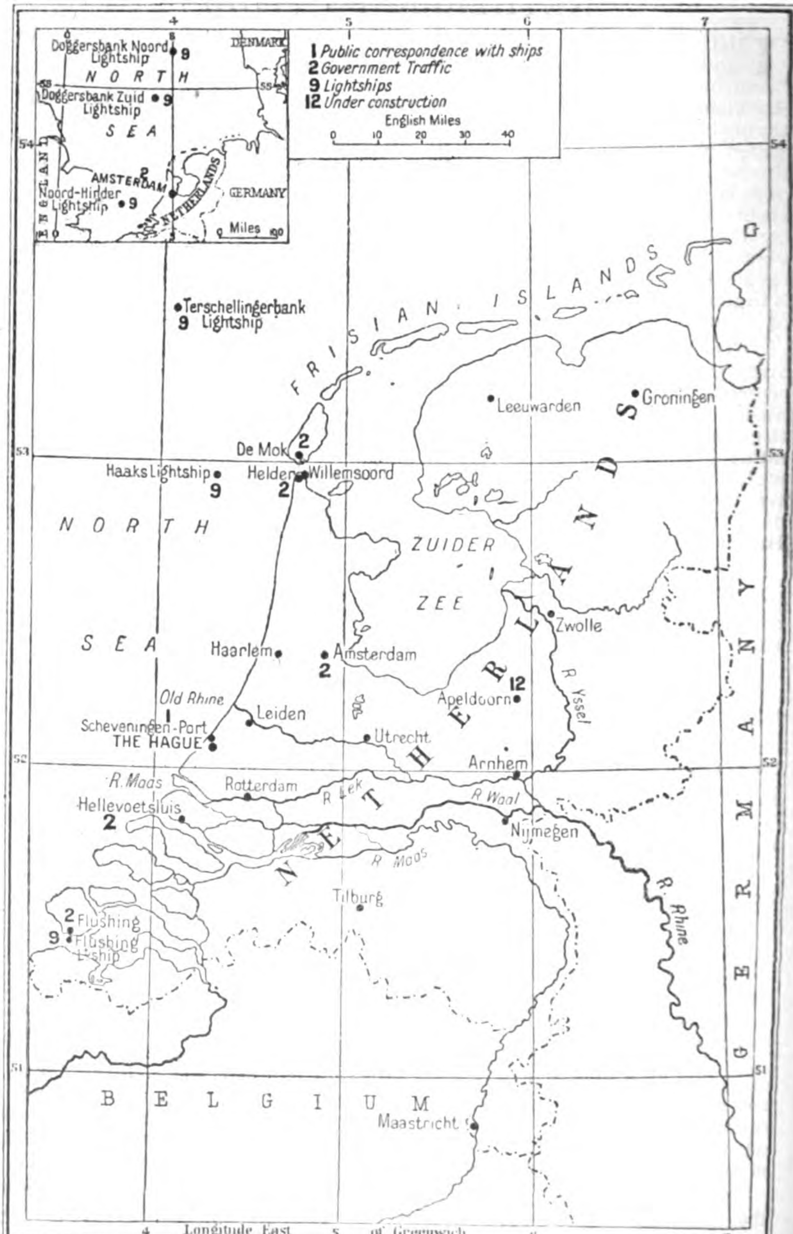
OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Minister A. A. H. W. König	Minister of Waterways ..	Zyne Excellentie den Minister van Waterstaat te s, Gravenhage
Mr. E. P. Westerveld ..	Director-General of Posts and Telegraphs	Den Heer Directeur Generaal der Posteryen en Telegrafie te s, Gravenhage
Mr. A. E. R. Collette ..	Chief Engineer, Director of Telegraphs	Den Heer Hoofdingenieur Directeur der Telegrafie te s, Gravenhage
Mr. J. A. Blandvan den Berg	Inspector of Coast and Ship Radiotelegraph Service	Den Heer Inspecteur bij den dienst der Kust-en Scheepsradiotelete s, Gravenhage

ORGANISATION.

Radiotelegraphy has from its initiation attracted much interest in Holland. As early as 1899 a commission (Messrs. B. J. R. Engelbregt, C. J. de Vriese, J. C. Ramaer, and Dr. L. Bleekrode) was appointed to report on the subject of the possibility of wireless communication between the lightship *Maas* and the Hook of Holland (16 km.). In the beginning of 1902 this communication was sufficiently ascertained. In the same year wireless traffic was established between the railway stations Enkhuizen and Stavoren on behalf of the ferry steamer between the two places.

In February, 1904, a Marconi station was opened at Amsterdam for the transmission to Broomfield, in Essex, of press messages and stock quotations. The messages were published in the newspaper *Het Handelsblad*. The correspondence was of private nature, and ceased after some time.


1 Public correspondence with ships
2 Government Traffic
9 Lightships
12 Under construction
English Miles
Doggersbank Noord Lightship
Doggersbank Zuid Lightship
NORTH SEA
DENMARK
ENGLAND
AMSTERDAM
Noord-Hinder Lightship
NETHERLANDS
GERMANY
Terschellingerbank Lightship
FRISIAN ISLANDS
Leeuwarden
Groningen
De Mok
Haaks Lightship
Helder
Willemsoord
ZUIDER ZEE
Zwolle
Haarlem
Amsterdam
Old Rhine
Leiden
Scheveningen-Port
THE HAGUE
Utrecht
Apeldoorn
R. Yssel
Arnhem
R. Maas
Rotterdam
R. Lek
R. Waal
Hellevoetsluis
Nijmegen
R. Maas
Tilburg
R. Rhine
Flushing
Flushing L'ship
NETHERLANDS
GERMANY
BELGIUM
Maastricht
Longitude East of Greenwich

In September, 1904, the Government station, Scheveningen Port (North Sea coast, near The Hague), was opened for general public correspondence with ships at sea. Scheveningen was the first Government coast station of that nature in Europe.

Dutch radiotelegraphy has extended in all directions. On August 9th, 1920, the foundation stone of a station at Kootwyk, near Apeldoorn, was laid. This station is destined for direct communication with the Dutch East Indies. The receiving station situated at Sambeek, near Boxmeer, was completed earlier, and test service messages are received there regularly. The distance of 60 km. between these two stations makes them suitable for duplex-working.

In the course of 1920 a meteorological service was established on behalf of aviation between the military radio station at Soesterberg and the station of the Air Ministry at London.

Since August 2nd, 1920, the military station Bé (Vossegat) is sending regularly weather reports from the Koninklyke Meteorologisch Instituut.

In 1920, a regular radio service open for public correspondence was established between the Netherlands and Germany, and in 1921 between the former country and Great Britain.

Since June, 1920, a Government committee has been studying the desirability of erecting direction-finding stations on the Dutch coast; as yet its researches have not been concluded.

LAND STATIONS (NETHERLANDS).
January 1st, 1921.

Official correspondence; Naval stations, (Aerodromes and Army stations not included)	5
Government station open for public service with ships	1
Government station open for public service (Land traffic)	1

Moreover there are a large number of amateur stations only suitable for reception.

SHIP STATIONS (NETHERLANDS).

January 1st, 1921.

Stations worked by private enterprise open for public service	344
Navy stations (submarines, torpedo boats, etc., not included)	38
Special stations on board lightships	5

LAND STATIONS (DUTCH EAST INDIES).

(*According to the latest available statistics.*)

Stations for public correspondence with ships ..	5
Stations for restricted public correspondence with ships	2
Stations under construction	1

LAND STATIONS (CURAÇAO).

Public correspondence with ships	3

A permit has been granted for the working of some stations on board river boats of the police at Rotterdam. Other private stations have been allowed for scientific and similar purposes. Temporary permits have also been granted to the Stock-Jobbing Union at Amsterdam for radiotelephonic publications of rates during time of Exchange and to a station at Ymuiden for radiotelephonic correspondence with fishing boats. For stations only suitable for reception a permit is not necessary.

Stations on ships at sea may not be established or worked by private enterprise without a license issued by the Queen. The general conditions which are imposed are laid down in the form given below (E).

ADMINISTRATION.

The regulation of radiotelegraphy was first instituted by including a clause relating to wireless in the Telegraph and Telephone Act of 1904. This Act has been supplemented and amended, as far as radiotelegraphy and telephony are concerned.

In 1919 Parliament passed the Bill (presented by the Minister of Agriculture, Industries and Commerce in 1916) to give effect to the International Convention for the Safety of Life at Sea. This Act (Shipping Convention Act of April 5th, 1919) is in agreement with the Articles of the Convention, but has not yet come into force.

The Netherlands possesses important colonies in the East Indies, as well as in South America, and the wireless laws and regulations current in those colonies are appended in the following pages.

The text (so far as radiotelegraphy is concerned) of the following enactments figure below :—

A—Telegraph and Telephone Act, 1904 (supplemented and amended by the Act of March 21st, 1919).
B—Royal Decree of the 10th May, 1906.
C—Regulation for Colony of Curaçao.
D—Regulation for Dutch East Indies.
E—Form of License for Ship Stations.
F—Prescriptions issued by the Minister of Waterways regarding the working of foreign vessels within territorial waters or on waters within the territory of the kingdom.
G—Form of License for Experimental Stations.
H—Royal Decree of July 9th, 1921, relating to receiving arrangements of Radiotelegraphy and Radiotelephony.

TELEGRAPH AND TELEPHONE ACT OF 1904.

A The Telegraph and Telephone Act of 1904 mainly refers to the ordinary wired services, and it has not been judged worth while, therefore, to reprint it in full here.

According to Article II of this Act, a license granted by the Queen is necessary before telegraphs and telephones can be established or worked by private enterprise. The Act also contains the terms under which the license is issued and the conditions binding on the licensee.

The above provision is also applicable to wireless telegraphy.

Article III prescribes that for the establishment and the use of radiotelegraph and telephone stations not destined for general public service an authorisation from the Minister of Waterways is required.*

Art. IIIa.—It is forbidden to work radiotelegraphs and telephones, be they destined for public service or not, on board vessels other than of Dutch nationality when within territorial waters, or in waters within the territory of the kingdom, unless it be done in accordance with the prescriptions fixed by the Minister of Waterways (*see* " F ").

For the radiotelegraphs and telephones referred to in the first part of this Article neither license nor authorisation is required, unless they are within the territorial waters of the kingdom and without the license required in virtue of the International Telegraph Convention (with Regulations) of London such as it is at present constituted (Staatsblad 1913, No. 132) or may be constituted, also as it may be modified for the Netherlands.

* Note.—Stations only suitable for the reception of radiotelegraphic signals are not considered as radiotelegraph and telephone stations.

B Decree of May 10th, 1906, relating to the fixing of provisional tariff for telegraphic communications for reports and distress signals received by radiotelegraphic means from ships at sea.

Art. 1.—The Government Office with radiotelegraphic service at Scheveningen Harbour shall report by telegraph, to those who have notified themselves for the purpose, the communications from ships and distress signals received by way of radiotelegraphy.

Art. 2.—The reports referred to in Article 1 shall be supplied within the Netherlands subject to the payment by the addressee of a coast charge of 1 florin for the present for each communication, increased by an amount of 50 cents if the telegram to be drawn up does not contain more than 10 words, and of 25 cents above this for each successive 10 words or fraction thereof.

Nevertheless, the reports herein mentioned may also be supplied against such a fixed price per year as shall be fixed by our Minister of Waterways, Commerce and Industry for each interested party, taking into consideration both

the number and the extent of the required information and also the above-named tariff.

In supplying the reports referred to in this Article to interested parties outside the Netherlands, the above-mentioned costs will be increased by the foreign telegraphic tariff applying thereto.

ART. 3.—This Decree shall come into operation on the second day after the date of the *Staatsblad* and the *Staatscourant* in which it is published.

Our Minister of Waterways, Commerce and Industry is entrusted with the execution of this Decree, which shall be published simultaneously in the *Staatsblad* and in the *Staatscourant*, and a copy whereof shall be sent to the State Council.

REGULATIONS FOR TELEGRAPHIC SERVICE IN THE DUTCH COLONY OF CURACAO.

(See map on p. 376.)

Publication No. 52 of 1909. (21st September.)

CThe Governor of Curaçao, in view of the desirability of replacing by new regulations the decree of the 30th October, 1873, regulating the inland and foreign telegraph communication of the colony as well as that of the 27th September, 1884, regulating telephonic communication, and having received the sanction of the Colonial Council, has determined on the following decree :—

ART. 1.—In this decree it is understood that telegraphs and telephones refer to the usual line-telegraphs and telephones as well as to radiotelegraphs and telephones.

ART. 2.—No telegraphs and telephones may be installed on any of the islands of the colony by others than the Government, unless a special permit is granted. Besides the special conditions, made in each case, the general rules are :—

(*a*) The erection, maintenance and exploitation should be carried out to the satisfaction of the Governor.

(*b*) The tariffs, conditions of use and service regulations must be submitted for the approval of the Governor.

(*c*) The concession may be granted absolutely or conditionally, but for no longer period than 25 years.

(*d*) The concession may be withdrawn by the Governor if the above rules or the special conditions are not followed.

ART. 3.—It is forbidden, without the permission of the Governor, to use radiotelegraphs or telephones, fitted on board foreign or private-owned Dutch ships, in the ports or anchorages of the colony, unless in special circumstances, the exigencies of good seamanship render it necessary to do so.

ART. 4.—Everybody may make use of telegraphs and telephones under the existing regulations. The transmission of telegrams or the conversation by telephone may be stopped or refused if in conflict with the safety of the colony, public order, or common decency.

The reasons for refusal or stoppage should be communicated to the party concerned.

The decision of the Governor may be invoked in such cases.

ART. 5.—For the public interest the Governor may put telegraph and telephone service under control or partially suspend it for an indefinite period.

ART. 6.—In case of war, or if any of the islands of the colony be placed under martial law, if so desired the telegraphs and telephones may be put under Government control.

ART. 7.—Imprisonment of one day to six months and fines from 10 florins to 1,000 florins conjointly or separately will be inflicted on those who erect or exploit telegraphs and telephones, without the permission required as specified in Art. 2; or who on board private-owned ships, make unlawful use of the same (Art. 3).

The instruments may, in so far as they are owned by the guilty parties, be confiscated.

ART. 8.—Anyone who wilfully damages or destroys telegraph and telephone works, including cables, in use for public benefit, will be punished with imprisonment from three months to three years.

Anyone who causes such damage as is referred to above, through neglect, may be punished with imprisonment of one day to one month or a fine of 1 florin to 100 florins.

ART. 9.—Deals with the punishment of crimes committed in which telephones are used.

ART. 10.—Libellous, offensive and indecent expressions used over the telephone, will be considered as uttered in public.

ART. 11.—Violation of the secrecy of telegraphs and telephones is punishable in accordance with Arts. 137 and 327 of the existing law.

ART. 12.—Owners of property have to allow, if it is necessary, work to be done on it in connection with the erection of public telegraphs.

ARTS. 13, 14, 15 and 16 deal with the use of private property in the erection of telegraph and telephone lines.

ART. 17.—All precautions should be taken to prevent lightning being conducted along cables or lines.

ART. 18.—The above may be referred to as "Telegraaf- en Telefoon-Verordening 1909," adding the number of the publication.

ART. 19.—Decrees of 30th October, 1873 (P.B. 1874, No. 1) and of 27th September, 1884 (P.B. 1884, No. 14) as well as P.B. 1892, No. 27, are withdrawn.

ART. 20.—Concessions relating to the erection of telegraphs and telephones on any of the islands of the Colony of Curaçao, granted before this decree comes into force, will be treated as coming under the regulations in force when they were made.

REGULATIONS FOR TELEGRAPH SERVICE IN THE DUTCH EAST INDIES.

6th October, 1876.

(See map on p. 146.)

DThe old regulations issued by decree of 31st March, 1858, concerning the electro-magnetic telegraphs should now be superseded and new regulations as hereunder be brought into force.

Regulations concerning the erection and use of telegraphs in the Dutch East Indies.

ART. 1.—No telegraphs may be erected or used without permission of the Government, except those exclusively owned and used privately.

ART. 2.—The conditions for permission to erect such telegraphs will be fixed in each case separately.

ART. 3.—The Governor-General has the right to take possession of all telegraphs or to stop their exploitation.

ART. 4.—If telegraphs are erected without permission open for public traffic, a fine of from 200 florins to 1,000 florins can be inflicted.

ART. 5.—Owners of property have to allow, if it is necessary, work to be done on it in connection with the erection of public telegraphs.

ART. 6.—They should give access to officials and not interfere with the work done and the lines erected.

ART. 7.—If they refuse access they will be fined from 25 florins to 100 florins.

ART. 8.—They have a right to compensation or damage done to their property.

ART. 9.—Everybody has a right to have telegrams sent under the conditions laid down in the service regulations.

ART. 10.—The State or the Telegraph Company is not responsible for the transmission of telegrams in general or within a certain time.

ART. 11.—Punishment for embezzlement or opening of telegrams, communication of their contents to outsiders, etc., will be inflicted in accordance with the existing laws.

ART. 11*a*.—Telegrams, the contents of which are of danger to the State, or in conflict with the law, or of an obscene character, will not be accepted or delivered.

ART. 12.—Punishment in accordance with the existing laws is to be inflicted on every official who falsifies telegrams and on those who knowingly profit by the misuse of such telegrams.

ART. 13.—Damage to telegraph works or material is punishable with imprisonment and penal servitude.

ART. 14.—The Head of the Local Council may order, on request of the Chief of the Telegraph Service, the removal of everything impeding the efficiency of that service.

The above was published in the *Official Gazette* (*Staatsblad*) of the Dutch East Indies, and the regulations also apply to Telegraphs or Telephones, whereby the apparatus at both ends is not connected with wires or conductors (Decree of 7th December, 1903. *Staatsblad*, No. 405, supplemented by Decree of 8th September, 1905. *Staatsblad*, No. 403).

LICENSE FOR SHIP STATIONS.

ART. 1.—In this license is meant—

By Convention: the Radiotelegraphic Convention with final protocol, signed in London on July 5th, 1912, and all alterations and additions, that may be made thereto.

By Regulations: the Regulations belonging to this Convention with all alterations and additions that may be made thereto.

ART. 2.—The license is given for an indefinite period, and may be withdrawn at any time, after one year's notice.

The license, or an authentic copy of it, should always be kept on the ship. It must be shown on request abroad if asked for by the persons authorised herein.

ART. 3.—*System.*—The licensee is obliged to choose a system capable of communication with the Government stations opened for public radiograms, and to make the installation comply with the International Laws and Regulations. The antenna input should be such as to enable a decrease down to 10 per cent. of the maximum input. If an emergency set is required, as set forth in Art. XI of the International Regulations, the source of power, and eventually the other parts of the installation, must be fitted on or above the upper deck, and, furthermore, are subject to the rules to be made therefor by the Director-General of Posts and Telegraphs. In case the position of the wireless cabin does not give the telegraphist direct communication with the bridge, without leaving the operating room, direct communication must be established as may be required by the Director-General of Posts and Telegraphs.

ART. 4.

Hours of Service.

A. *First Class.*—On ship stations belonging to the first class, as stipulated in Art. 13, s. 3, of the Regulations, a continuous service is maintained. Except in cases of *force majeure* these rules should not be discarded without consent of the Director-General of Posts and Telegraphs.

B. *Second Class.*—On ship stations belonging to the second class, as stipulated in Art. 13, sec. 3, of the Regulations, the service is maintained during the hours indicated in the official list of radiotelegraphic stations. The hours of service are fixed in consultation with the Director-General of Posts and Telegraphs. Except in cases of *force majeure*, these rules should not be discarded without consent of the Director-General of Posts and Telegraphs.

C. *Third Class.*—Here the article only stipulates that the ship station belongs to the third class as indicated in Art. 13, sec. 3, of the Regulations.

ART. 5.

Information.

As for the station on shipboard the licensee is obliged to provide the Director-General of Posts and Telegraphs with all facilities and information necessary for the fulfilment of all legal requirements.

ART 6.

Approval of the Ship Station and its Operators.

No station on shipboard may be worked before the Director-General of Posts and Telegraphs has approved of the installation, as well as of the numbers, class and ability of the operators. A written document approving of the installation is handed over by the Director-General of Posts and Telegraphs, and should be hung up close to, or inside, the operating room. Any change made must be approved of in the same way.

Officers authorised by the said Director-General of Posts and Telegraphs must always be admitted for the purpose of testing whether the plant still fulfils the requirements. Any examination effected in this way is registered on the said document.

As a proof that the operators are competent, a certificate containing the name of the holder mentioning the class, is issued by the Director-General of Posts and Telegraphs. Moreover, it is stated thereon that the bearer is under an obligation to the said Director-General of Posts and Telegraphs of keeping secret any telegrams that might come to his knowledge by virtue of his position on board ship.

This certificate may be withdrawn if it is evident to the Director-General of Posts and Telegraphs that the holder no longer fulfils the requirements, or that he has failed to observe the conditions of this license.

Alterations to the installation of the ship station falling under any rule of the Convention or the Regulations, and changes concerning the

operators must be at once reported to the said Director-General of Posts and Telegraphs.

ART. 7.

Authorisation to work Station.

The licensee is authorised to exchange telegrams with stations opened to public correspondence, as well as with stations not destined for public wireless traffic, as far as this does not interfere with public correspondence; both authorisations hold good, subject to their not infringing any private rules which might be in force at any of these stations. All communication by a ship station must cease immediately upon the request of a Dutch coast station open to public correspondence.

ART. 8.

Wavelength.

In addition to the wavelength of 600 and 300 metres provided for in Art. 3 of these Regulations, other wavelengths less than 600 metres are used in some cases according to the provisions made by the Director-General of Posts and Telegraphs.

ART. 9.

Places where Transmission is Prohibited.

Apart from the conditions of the Regulations appertaining thereto, it is hereby forbidden without the consent of the Director-General of Posts and Telegraphs, given with due regard to the relevant conditions, to use the ship stations within Dutch territorial waters or any Dutch waters inside those limits, unless under special conditions the requirements of good seamanship make contravention of this rule a necessity.

ART. 10.

Cessation of Traffic.

The working of a ship station is suspended either completely or partly as soon as it is judged necessary to the general interest. Upon the order of the Director-General of Posts and Telegraphs, the service may be suspended at certain places or daily during certain hours.

ART. 11.

Approval according to Art. 2 of the Telegraph and Telephone Act.

The remaining conditions concerning the use, Service Regulations, and the rate of wages and hours of duty of the operators, are submitted for the approval of the Minister of Waterstaat.

ART. 12.

Exchange of Telegrams.

The conditions of the Dutch Telegraph and International Regulations, and further, the conditions concerning the public Dutch radiotelegraph service, as well as all modifications and supplements thereto, refer to the exchange of telegrams.

ART. 13.

Ship Tax.

The ship tax amounts to .

ART. 14.

Accountancy.

The settlement of taxes takes place according to the rules to be fixed by the Director-General of Posts and Telegraphs.

ART. 15.

Secrecy of Correspondence.

The licensee is obliged to observe secrecy in regard to all telegrams which might come to his knowledge by means of the ship station. He must make sure that no person other than the operator in charge of the station has any opportunity of learning the contents of said telegrams.

ART. 16.

Forwarding of Documents.

The forwarding of documents concerning the radiotelegraphic service must take place under the rules of the Director-General of Posts and Telegraphs made according to the restrictions mentioned in Art. XI of the Regulations.

ART. 17.

Precautions.

The licensee is obliged to take all precautions desired by the Minister of Waterstaat within the period fixed in the license.

ART. 18.

Control.

Officers appointed by the Director-General of Posts and Telegraphs are authorised to control the working of the station and its operators, and to supervise the station service generally. If required they may also take temporary control of the station, upon showing a written and signed authorisation.

ART. 19.

Distress Signals.

For sending or receiving distress signals it is allowed to depart from the conditions of this concession, provided this deviation is necessary for the benefit of the ship in distress. For the distress signal (which may also be given in cases of other accidents than those which may occur to the ship concerned) no other signal may be used except the signal ● ● ● ▬ ▬ ▬ ● ● ●, unless approved by the Director-General of Posts and Telegraphs.

ART. 20.

Meteorological Telegram, Time Signals, and other Signals.

The licensee is obliged to adhere to the rules which are made by or on behalf of the Minister of Waterstaat with reference to meteorological telegrams, time signals, and other signals.

ART. 21.

Authorisation and Obligations Outside the Territorial Waters of the (Dutch) Kingdom.

Outside the territorial waters of the Kingdom the rules of this license are valid in so far as they are not contradictory to the Laws and Regulations which hold good in the locality in question.

ART. 22.

Other Rules and Regulations.

Moreover, the licensee is subject to and henceforth obliged to adhere to all Regulations referring to radiotelegraphy which are prescribed or will be prescribed by Dutch law; by the Convention and the Regulations; or by any other International agreement to which Holland accedes or will accede; as well as to any modifications which may be deemed necessary for the execution of such Regulations.

ART. 23.

Withdrawal of License.

This license may be withdrawn—

1. If within a year no use is made of it.

2. By not adhering to the prescriptions of the Telegraph and Telephone Act of 1904 (Official Collection of Laws No. 7), under which prescriptions this license is granted, or by not adhering to any rule mentioned in the said national or international legal prescriptions.

3. If the ship mentioned at the beginning of this license ceases to be a Dutch ship.

ART. 24.

Further Obligations of the Licensee.

A. *First Class.*—The licensee is under an obligation to give immediate notice to the Director-General of Posts and Telegraphs when an altered service Regulation in consequence of Art. 4, last paragraph, of this license is introduced, also when the ship on which the station has been fitted is out of commission or changes owners.

B. *Second Class.*—The licensee is under an obligation to give immediate notice to the Director-General of Posts and Telegraphs when an altered service Regulation in consequence of Art. 4, last paragraph, of this license is introduced; also when the ship on which the station has been fitted is out of commission or changes owners.

C. *Third Class.*—The licensee is under an obligation to give immediate notice to the Director-General of Posts and Telegraphs if the ship on which the station has been fitted is out of commission or changes owners.

ART. 25.

Violation of Rules.

In addition to the withdrawal of license mentioned in Art. 23, except in cases of *force majeure*, the licensee is fined from F. 10 to F. 1,000, at the discretion of the Minister of Waterstaat, for each violation of any rule laid down in this license, of the said national or international legal prescriptions, as mentioned herein, and is fined from Fl. 1 to Fl. 100 for each day, after the period fixed for paying the fines, that he fails to adhere to the rules of this agreement.

Dating from the day on which the decision to withdraw the license in consequence of Art. 23 has been taken, fines are no longer due. This article may be applied immediately the said Minister decides the legal grounds for administering a fine; or the legality of a claim on grounds of *force majeure*.

In addition to the fine, the said Minister will decide to what cause the violation is due, to enable him to take action according to the contents of Art. 12 of the Regulations.

ART. 26.

Acceptance.

A declaration of agreement must be forwarded to the Director-General of Posts and Telegraphs, within the period fixed by him, intimating an acceptance of the terms of this license.

PRESCRIPTION ISSUED BY THE MINISTER OF WATERWAYS.

F Regulations which are prescribed by the Minister of Waterways and which in as far as they do not differ from any international agreement, to which the Netherlands are, or will be bound, are valid for foreign radiotelegraphic or telephonic ship stations which are within territorial waters or in waters within the territory of the Kingdom.

ART. 1.—1. It is forbidden to use radiotelegraphs or telephones be they destined for public service or not, installed on board of foreign ships within Dutch territorial waters or waters within the territory of the Kingdom, unless the prescriptions of this disposition are observed.

2. Moreover shall, as far as waters within the territorial limits of the Kingdom are concerned, those stations only may be worked by consent of the Director-General of Posts and Telegraphs when due regard is given to the conditions prescribed in said permit.

3. Contravention of the rules as set forth in parts 1 and 2 of this article is allowed under special conditions, the requirements of good seamanship should make this necessary.

ART. 2.—1. Foreign ship stations may exchange telegrams or have a conversation with radiotelegraph or telephone stations destined for public service under reserve of the special rules, which might be valid for any one of these stations.

2. The exchange of traffic with stations not destined for public service is permitted under reserve of the special rules which might be valid for any one of these stations, and in so far as in the opinion of one or more public stations, the general public radio telegraphic or telephonic service is not interfered with.

3. All traffic of foreign ship stations is immediately to be suspended, as soon as such is requested by any Dutch coast station open for general public service.

ART. 3.—1. It is forbidden that by means of foreign ship stations hindrance should be given to the exploitation or the use of Government radiotelegraphs and telephones be they destined for public service or not, or to the exploitation of other radiotelegraphs and telephones destined for public service.

2. Foreign ships must cease working of their stations as soon as they observe or when they are informed, that their working gives rise to an interference as described in part 1 of this article.

ART. 4.—1. The Minister of Waterways may suspend the working of foreign ship stations either completely or partly as soon as it is judged necessary.

2. The Director-General of Posts and Telegraphs has equal competency as far as it concerns suspension at certain places or daily during certain hours.

The licensees of foreign ship stations are subject to and henceforth obliged to adhere to all Regulations referring to radiotelegraphy or telephony which are prescribed by the International Radio Telegraph Convention with final protocol and Regulations of London such as it is at present (Staatsblad 1913 No. 132), of, later on, also for Holland, might be modified, either are or shall be prescribed by any other International agreement to which Holland accedes or will accede.

FORM OF LICENSE FOR EXPERIMENTAL STATIONS.

G ART. 1.—The authorisation is granted until further notice.

ART. 2.—The wireless telegraph and telephone are exclusively intended for the testing of apparatus and plant.

ART. 3.—All wireless telegraph and telephone working is stopped immediately a Government station asks. By "Government station" a military station is also understood.

ART. 4.—If the wireless telegraph or telephone is used in such a manner that energy is radiated outwards, a receiving apparatus must be set up after at the most three minutes for the reception of distorted messages. In the case of such use the holder of the authorisa-

tion is bound to have it connected with a trunk telephone.

Art. 5.—The use of the wireless telegraph and telephone may be wholly or partially withdrawn when such is deemed necessary in the public interest by the Minister van Waterstaat.

On the order of the Director-General of Posts and Telegraphs the working may be withdrawn during certain hours of the day.

Art. 6.—The holder of the permit must during the period for which it is available observe all measures which are decreed by or on behalf of the Minister van Waterstaat.

Art. 7.—The officials to be designated by the Director-General of Posts and Telegraphs are authorised to control the working of the wireless telegraph and telephone.

In this connection access to the radiotelegraphic and radiotelephonic apparatus must always be granted to these persons.

Art. 8.—The holder of the permit must take note of all such clauses of a Dutch or international regulation as are or shall be confirmed with relation to radiotelegraphs and radiotelephones of the kind for which this permit is granted.

Art. 9.—No use may be made of the permit until it has been accepted by means of a declaration to be sent in.

Art. 10.—Subject to the approval of the Minister van Waterstaat the permit may be transferred, subject to a declaration to be sent in in this connection to the above-mentioned Minister and signed by the holder of the permit and his successor.

622.—RECEIVING ARRANGEMENTS FOR RADIOTELEGRAPHY AND RADIOTELEPHONY.

H By Royal Decree of July 9th, 1921 (Staatsblad No. 908), of which the text is given below, the Minister van Waterstaat is given authority to make regulations with which apparatus exclusively intended for receiving wireless telegraphic and telephonic signals shall comply, and furthermore penalties are decreed for non-observance of the rules.

Text of the Royal Decree of July 9th, 1921 (Staatsblad No. 903), containing supplement to and alteration of the Royal Decree of March 6th, 1905 (Staatsblad No. 90), finally revised in the Royal Decree of November 15th, 1919 (Staatsblad No. 753).

Art. 1.—After Article 2 of Our Decree of March 6th, 1905 (Staatsblad No. 90) is inserted an Article 2 bis as follows :—

Without prejudice to the enactments of the preceding Article the posession and the use of apparatus which are exclusively fitted for the receipt of radiotelegraphic and radiotelephonic signals are only granted subject to observance of the regulations which shall be made by Our Minister van Waterstaat.

Art. 2.—Article 4, first paragraph, as previously resolved by us is to be read as follows :—

The officials of the Royal and Municipal Police, and the Inspectorate of the coastal and ships' wireless telegraphy, the chief engineers and engineers, electrotechnical head officials and officials of the Telegraph Service are charged with the maintenance of these general rules prescribed by the Government.

Art. 3.—In Article 5 of the Decree as given by Us the words "the Articles 1 and2" are replaced by the words "the Articles 1, 2 and 2 bis."

Art. 4.—This Decree comes into force on the second day from the date of the Staatsblad in which it appears.

The Decree came into force on August 7th, 1921.

The regulations of Art. 1 heretofore mentioned are :—

Text of the Ordinance of the Minister van Waterstaat of August 8th, 1921, No. 1, Department of Posts and Telegraphs.

Art. 1.—In this Ordinance is understood :—

By "Minister," the Minister van Waterstaat.

By "Director-General," the Director-General of Posts and Telegraphs.

By "signals," radiotelegraphic or radiotelephonic signals of any kind.

By "receiving apparatus," apparatus maintained by or used by others than the State which are exclusively designed for receiving radiotelegraphic and/or radiotelephonic signals.

Art. 2.—It is forbidden to take note in any way of signals received which are intended for another, or to communicate their contents, the substance of them or their existence to a third party or to allow them to be so communicated.

Art. 3.—Users of receiving apparatus must observe all orders which are directed to them with reference to the apparatus by the Director-General or, in the cases set forth in Article 18 of the Telegraphs and Telephone Act, 1904 (Staatsblad No. 7) by the military authorities.

Art. 4.—The receiving apparatus are subject to any control which is deemed necessary by the Director-General or, in the cases set forth in Article 18 of the Telegraphs and Telephones Act, 1904 (Staatsblad No. 7), by the military authorities.

The officials appointed by or on account of the Director-General or the authorities must always be allowed to inspect the apparatus, and note all that has bearing on what is received.

Art. 5.—Users of receiving apparatus must give notice of its presence to the local Director of the Royal Telegraph Office or to a neighbouring Post Office if there is not one in the town. This is to be done by means of a form which can be obtained from all post offices free of cost.

On this form when completed must be shown :—

1. Surname and Christian names of the user of the apparatus, the date and the year of his birth, his town and address, and exact indication of where the apparatus is situated.
2. It must be stated whether lamps or other apparatus are used which can send out waves obstructing wireless traffic.
3. That the user is acquainted with the regulations governing the use of the apparatus, and that he accepts them unconditionally.

When the form is sent in an acknowledgment of receipt is issued by the Director of the Post Office in question. The user must be able to produce this receipt at all times, and in default it will be assumed that no form was completed.

NEW CALEDONIA

(See FRANCE.)

NEWFOUNDLAND

(See map on p. 174.)

THE Island of Newfoundland lies between 46° 37′ and 52° 39′ north latitude; its longitude stretching from 52° 35′ to 59° 25′ west. Its north-western side is bounded by the Gulf of St. Lawrence, whilst the Straits of Belle Isle divide it from the North American Continent. It is triangular in shape (almost equilateral), with Cape Bauld on the north, Cape Race on the south-east, and Cape Ray on the south-west.

Newfoundland ranks as the oldest British Colony, having been formally occupied by Sir Humphrey Gilbert in August, 1583. A Governor was first appointed in 1728, and in 1855 "Responsible Government" was accorded.

The Executive is vested in a Governor aided by an Executive Council with a legislature of two houses.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Hon. Mr. R. A. Squires, K.C., LL.B. ..	Prime Minister and Colonial Secretary..	St. John's
Hon. Mr. W. F. Coaker	Minister of Marine and Fisheries ..	do.
Hon. Mr. W. W. Halfyard..	Minister of Posts and Telegraphs.. ..	do.
Hon. Mr. Arthur Mews, C.M.G.	Deputy Colonial Secretary	do.
Mr. H. W. Le Messurier, J.P., C.M.G. ..	Deputy Minister of Customs	do.
Mr. Campbell	Secretary & Inspector Post Office ..	do.

Mr. H. W. Le Messurier, C.M.G., the Deputy Minister of Customs, refuses clearance to any vessels of Newfoundland Register not licensed in conformity with the Acts, or whose operators are not in possession of provisional service certificates issued by the Minister of Posts.

ORGANISATION.

The Colony is proud of its association with the first wireless message flashed across the Atlantic. This was received by Senatore Marconi himself on Signal Hill, an eminence overlooking the narrows of St. John's. Newfoundlanders hope that ere long some suitable memorial may be erected on Signal Hill of this epoch-making event.

In 1906 an agreement was made under which the Marconi Wireless Telegraph Company of Canada undertook to operate all the Labrador stations during the fishing season of each year, the Newfoundland Government to pay the company an annual royalty, and the revenue accruing from this traffic to go to the company, who further agreed to forward all traffic over the Newfoundland Government Postal Telegraph System.

The success of this arrangement prompted the Government to propose an extension of the system on the Labrador Coast by two or more stations—the Marconi Company to erect and operate the stations under the terms of the agreement. In the summer of 1913 stations were accordingly erected by the Marconi Company at Cape Harrison and Mokkovik. In 1911 it was agreed to establish a station between Indian Harbour and Cape Harrison to complete the chain on the Labrador Coast.

After further negotiations, an important agreement was concluded in December, 1912, which covers the following points: The old agreement terminating in 1916 is extended for a further period of ten years, terminating in 1926; all other undertakings entered into in the earlier agreement will be continued until 1926. The Marconi Company has erected and is operating a station at Fogo, on the east coast of Newfoundland—this station to be the property of the Marconi Company, and to be exempt from the Government tax of $4,000 during the currency of the agreement.

The Sealing Industry forms an important item in the industrial activities of the Colony, and the disaster of 1914 (wherein the *Southern Cross* was lost with all hands) led to the instalment of wireless equipment on the fleet of sealers, which was made compulsory by legislation to that effect.

At the present time the following stations exist :—

Public service to ships	5
Government service only	1
Public inland traffic	9
Direction-finding service	1
Ship stations	17

ADMINISTRATION.

The general Regulation of Wireless is governed by the Posts and Telegraph Acts, 1891 to 1906.

A—Act of 1905 (Cap. VII).
B—Post and Telegraph Act, 1906.
C—Wireless Telegraphy (Steamers) Act, 1914.
D—Wireless License.
E—Provisional Certificate for Wireless Operators.
F—Amateur Experimental License.

THE ACT OF 1905, CAP. VII.

A This Act refers to taxes upon business transacted by telegraph and telephone companies within and in transit through the Colony. Clause 2, Section 2, reads as follows :—

A sum equal to one per cent. in manner hereinafter provided of the total amount received by or due to the company in respect of all telegraphic messages passing over the land lines of the company or transmitted or received by any wireless method of telegraphy to or from any place within this Colony from or to any other place within this Colony during a period of twelve calendar months ending on the first day of May of each year: Provided that this subsection shall not apply to messages which originate or are delivered in any place outside the Colony.

The first of such payments shall be made on the 30th day of June, 1906, in respect of the period of twelve months ending on the preceding first day of May.

Section 4 of the same Clause (2) reads as follows :—

A sum of four thousand dollars ($4,000) in respect of every wireless telegraph station or other means of communication by wireless methods of telegraphy between this Colony and any place, ship or vessel outside this Colony, for the time being belonging to or worked by or on behalf of the company which now is or hereafter shall be established in this Colony.

The first of such payments shall be made on the 30th day of June, 1906: Provided that if the Governor in Council is satisfied that any such wireless telegraph station or other such means of communication is established for the purpose only of reporting passing ships or vessels, he may dispense the payment of such last-named sum and discharge the company from liability therefor in respect of such station or means of communication.

Clause 1 (1) of the Act of June 15th, 1905, Cap. XXI, reads :—

Whenever in the opinion of the Governor an emergency shall have arisen in which it is expedient for the public service that the Government of the Colony shall have control over the transmission of messages over any telegraph line, telephone line, or by any other form of telegraphy, it shall be lawful for the Governor in Council at any time to assume and for any length of time retain possession of any telegraph line, telephone, or any form of telegraphy in this Colony, and of all things necessary for the efficient working thereof, and may for the same time require the exclusive service of the operators and other persons employed in working such telegraph line, telephone, or any form of telegraphy; and the company or other proprietor of such telegraph line, telephone or any form of telegraphy, shall give up possession thereof, and the operators and other persons so employed shall, during the time of such possession, diligently and faithfully obey such orders and transmit and receive such despatches as they are required to receive and transmit by any officer duly authorised by the Governor in Council, and every company or other proprietor, operator or person violating any of the provisions of this section shall incur a penalty not exceeding one hundred dollars ($100) for every refusal or neglect to comply with the requirements thereof, such penalty to be recovered by action in the name of the Minister of Finance and Customs, in a summary manner before a Stipendiary Magistrate or Justice of the Peace.

POST AND TELEGRAPH ACT, 1906.

B 1. (1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy, in any place in this Colony or on board any ship registered in this Colony, except under and in accordance with a license granted in that behalf by the Postmaster-General, with the consent of the Governor in Council.

(2) Every such license shall be in such form and for such period as the Postmaster-General may determine, and shall contain the terms, conditions, and restrictions on and subject to which the license is granted, and any such license may include two or more stations, places or ships.

(3) If any person establishes a wireless tele-

graph station without a license in that behalf, or instals or works any apparatus for wireless telegraphy without a license in that behalf, he shall be guilty of a misdemeanour, and be liable on conviction in a summary manner before a Stipendiary Magistrate to a penalty not exceeding fifty dollars, and on conviction on indictment to a fine not exceeding five hundred dollars or to imprisonment, with or without hard labour, for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Act except by order of the Postmaster-General.

(4) If a Stipendiary Magistrate is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship as aforesaid without a license in that behalf, he may grant a search warrant to any police officer or any officer appointed in that behalf by the Post master-General, and named in the warrant, and a warrant so granted shall authorise the officer named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) When a fine under this Act is imposed by a Court, Judge or Magistrate, and the master or owner of any ship is ordered to pay the same and the same is not paid at the time and in the manner prescribed, the Court, Judge or Magistrate making the order may, in addition to any other powers they may have for the purpose of compelling payment, direct the amount remaining unpaid to be levied by distress and sale of the ship, her tackle, furniture and apparel.

(6) The Postmaster-General may make regulations for prescribing the form and in which applications for licenses under this Act are to be made, and, with the consent of the Governor in Council, the fees payable on the grant of any such license.

(7) The expression "wireless telegraphy" means any system of communication by telegraph as defined in "The Post and Telegraph Acts, 1891 to 1904," without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

2. This Act shall be read with and form part of "The Post and Telegraph Acts, 1891 to 1904," and the said Acts and this Act may be cited as "The Post and Telegraph Acts, 1891 to 1906."

Wireless Telegraphy (Steamers) Act.

C The following Act respecting the provision of wireless telegraphy on steamers engaged in the trade of Newfoundland was passed on September 4th, 1914:—

1. Every steamer to which this Act applies shall be provided:—

(1) With a wireless telegraph installation approved of by the Minister of Marine and Fisheries;

(2) With at least one qualified wireless operator approved of by the Postmaster-General;

(3) With a Morse signalling apparatus approved by the Minister of Marine and Fisheries;

(4) With at least one person on board capable of operating such signalling apparatus and of reading signals from other ships.

2. The wireless telegraphy installation provided on a ship to which this Act applies shall be maintained in good order and shall be attended to by an operator qualified as aforesaid in accordance with rules and regulatious to be made by the Governor in Council under this Act for the purposes thereof.

3. No steamer to which this Act applies shall receive a clearance at any Custom House for the Seal Fishery or otherwise unless and until the Collector is satisfied that the provisions of this Act in respect of said steamer have been complied with.

4. If any requirement of this Act is not complied with in the case of any steamer to which this Act applies, the master or owner shall be liable for each offence to a fine of twenty-five hundred dollars, to be recovered in a summary manner before a Stipendiary Magistrate.

5. This Act shall apply to any steamer which ordinarily is engaged in prosecuting the Seal fishery from any port of this Colony, when engaged in the Seal fishery or when carrying more than sixty persons; and to any other vessel carrying passengers from or within this Colony when named by the Governor in Council in a Proclamation to be published in the *Royal Gazette*.

6. Nothing in this Act shall affect the obligation to obtain a license for a wireless telegraphy installation under "The Postal and Telegraph Acts, 1891 to 1906," or prevent the Governor in Council or other person exercising a like control over such wireless telegraphy in times of war or otherwise as may be exercised in respect of other wireless telegraphy.

D W. 19
Ship License No.............
19....

COLONY OF NEWFOUNDLAND.

"License to use Wireless Telegraphy."

Issued in accordance with the provisions of the London Convention, of 1912.

The herein named ....
resident of...............................
is hereby licensed to establish and operate a wireless telegraph station on board the ship ....for the term or period commencing on the first day of April, nintecn hundred and.............., and terminating on the thirty-first day of March, nineteen hundred and..............., and to instal and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of one dollar, being the licence fee for the privilege above named.

This license is subject to the following terms, conditions and restrictions:—

1. In this license, the following words and expressions shall have the several meanings hereinafter assigned to them unless there be something, either in the subject or context, repugnant to such construction, that is to say:

The expression "marine signalling" means signalling by means of any system of wireless telegraphy between two or more ships, between ships and shore stations and any other wireless telegraph station, or between shore stations and ships.

2. (1) The licensee shall not establish, instal or operate any apparatus for wireless telegraphy, except the apparatus hereinafter called the "licensed apparatus," specified in the said schedule hereto.

(2) No tolls, fees or other consideration shall be received, levied or collected by the licensee until the same have been approved of by the Government of Newfoundland.

3. (1) The licensee shall so operate the licensed apparatus as not to interfere with the working of any wireless telegraph station established in Newfoundland, or with marine signalling on the waters or territory of Newfoundland or neighbouring waters or territory.

(2) With a view to preventing such interference as aforesaid, the licensee shall comply with all directions which shall be given to the licensee by the Postmaster-General and with all rules prescribed by the Postmaster-General for observance by his licensees:

(*a*) With respect to all arrangements to be adopted for the purposes of syntony or enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station;

(*b*) With respect to any alternation of messages which the Postmaster-General may think necessary; and

(*c*) Generally with respect to avoiding interference between one wireless telegraph station and another.

(3) The licensed apparatus shall not, without the consent of the Postmaster-General, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

4. The licensee shall, if so required in writing by the Postmaster-General, cease to operate the licensed apparatus for such period (not exceeding...... hours in any one day) as may be specified by the Postmaster-General.

5. Subject to the provisions of this license, and in accordance with the regulations issued from time to time by the Postmaster-General, the licensee shall transmit and receive messages by means of the licensed apparatus to and from any coast station or to and from any other ship without regard to the particular system of wireless telegraphy installed at such coast station or on such other ship, on equal terms without favour or preference, whether as regards rates of charge, order of transmission or otherwise.

6. The licensee shall not be obliged to transmit and receive commercial messages by means of the licensed apparatus to and from a ship station on a ship registered in a country which does not adhere to the International Radiotelegraphic Convention, unless instructed so to do by the Postmaster-General in his regulations.

7. (1) If and whenever any Department of the Government shall require the licensee, his servants or agents to transmit, by means of the licensed apparatus, any message on His Majesty's service (including messages to and from ships of His Majesty's Royal Navy or Newfoundland or Canadian Government vessels), such messages shall have priority over all other messages, and the licensee, his servants and agents shall, as soon as reasonably may be, transmit the same, and shall, until transmission thereof, suspend transmission of all other messages, and the rates to be charged on such messages shall not exceed half the rates charged the ordinary public.

(2) The licensee shall not be entitled to claim any compensation in respect of the suspension of the transmission of messages as aforesaid.

8. The licensee shall, so far as possible, receive from all other stations all requests for assistance and all signals of distress and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus or any other means in his power.

9. The licensee shall not divulge to any person (other than properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and transmitted by marine signalling or by any system of wireless telegraphy.

10. All messages transmitted by means of the licensed apparatus shall be copied in full in registers to be kept by the licensee for that purpose, and in such registers each of such messages shall be accompanied by its identifying number and date and full particulars of its places of origin and ultimate destination and such further particulars as the Postmaster-General shall from time to time reasonably require to be shown, messages on His Majesty's service being in such registers distinguished from other messages. The license shall preserve all used message forms written and printed, and transcripts of messages and all other papers for such period as is from time to time prescribed by the Regulations of the International Radio telegraphic Convention, and such registers and message papers shall be open to the inspection of the Postmaster General or his officers thereto authorised at the head office of the licensee, in .... between the hours of 10 a.m. and 5 p.m., on every day except Sunday or a public holiday.

11. The Postmaster-General or his officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by wireless telegraphy and all other telegraphic instruments and apparatus fixed or being in such stations, and the working and user of such apparatus and telegraphic instruments.

12. The licensee shall prepare a detailed return of the messages handled by the licensed station during each month on the forms provided for that purpose by the Postmaster-General and shall forward the same to the Postmaster-General at the end of each month.

13. (1) The licensee shall observe at the station the provisons of the International Radiotelegraphic Convention as adhered to by His Majesty in respect of the Colony of Newfoundland and the detailed regulations from time to time made thereunder for carrying such provisions into effect.

(2) The licensee shall operate the licensed apparatus in accordance with any regulations which may be issued from time to time by the Postmaster-General.

14. Except with the consent in writing of the Postmaster-General the licensee shall not assign or sublet this license.

15. The licensed apparatus at the said ship station shall be worked only by a person or persons holding a certificate or certificates issued by the Postmaster-General.

Certificates shall be granted to persons of such technical proficiency, and shall be in such form and subject to such conditions as the Postmaster General may from time to time prescribe.

16. The licensees shall carry this license on the ship on which the ship station is established

under this license, and also such documents as may be prescribed by the Postmaster-General, for the purpose of enabling the licensee to communicate with coast stations in accordance with the rules and regulations of the International Radiotelegraphic Convention of Berlin, 1906.

17. (1) If, and whenever, in the opinion of the Postmaster-General or any officer in command of one of His Majesty's ships of war, an emergency shall have arisen in which it is expedient for the public service that the Government shall have control over the transmission of messages by the licensed apparatus, it shall be lawful for the said Postmaster-General, by warrant under his hand, to direct and cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty and to be used for His Majesty's service and, subject thereto, for such ordinary services as to the said Postmaster-General may seem fit, and in that event, any person authorised by the said Postmaster-General may enter upon the stations of the licensee, and take possession thereof and use the same as aforesaid.

(2) The Postmaster-General or any officer in command of one of His Majesty's ships of war may when he considers such an emergency as aforesaid to have arisen, instead of taking possession of the stations of the licensee, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus, either wholly or partly and in such manner as he may direct, and such persons may enter upon the licensee's premises accordingly, or the said Postmaster-General or officer may direct the licensee to submit to him all messages tendered for transmission or arriving by the licensed apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent and generally to obey all such directions with reference to the transmission of messages as the said Postmaster-General or officer may prescribe, and the licensee shall obey and conform to all such directions.

3. In any such case as aforesaid, if the licensee shows that during the exercise of any of the powers aforesaid, his receipts for the licensed apparatus with respect to which the said powers have been exercised have been less than his receipts from the same source during a corresponding period, the Government shall pay to the licensee, as compensation for any loss of profit sustained by the licensee by reason of the exercise by the Postmaster-General of any of the powers hereby reserved, such sum as may be settled between the Postmaster-General and the licensee by agreement or as in case of difference may be determined by arbitration. Provided always that no such compensation as aforesaid shall be paid if and so far as the powers hereby reserved to the Postmaster-General are exercised for the purpose of preventing direct communication with any of His Majesty's enemies, and, save with the consent of the Postmaster-General no such compensation shall be paid if and so far as the powers aforesaid are exercised for the purposes of preventing direct or suspected communication with any of His Majesty's enemies or of protecting the interests of His Majesty under the apprehension of impending war.

18. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Postmaster-General may, by writing revoke and determine these presents, and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

19. Nothing in these presents contained shall prejudice or affect the right of the Postmaster-General, from time to time, to establish, extend, maintain and work any system or systems of wireless telegraphic communication (whether of a like nature to that hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Postmaster-General, from time to time, to enter into agreements for or to grant licenses relative to the working and user of wireless telegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Newfoundland, by means of wireless telegraphy, with or to any person or persons whosoever upon such terms as he shall, in his discretion, think fit.

20. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Postmaster-General under these presents may be under the hand of any authorised officer, for the time being, of the Newfoundland Postal Telegraph Department and may be served by sending the same by registered letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered letter addressed to the Postmaster-General, St. John's, Newfoundland.

Name of Station.	Normal Range.	Description of Receiving Apparatus.	Wave-length	Source of Power and Maximum Output.	Maximum Power taken by Transmitting Instruments.		Frequency of Alternator, if any.	Ship Charge.
					Volts.	Amps.		

....

Minister of Posts and Telegraphs.

DEPARTMENT OF THE POSTAL TELEGRAPHS, NEWFOUNDLAND.

Dated at St. John's this............day of ....19.....

PROVISIONAL
WIRELESS OPERATOR'S CERTIFICATE.

E This is to certify that the bearer...........................
resident of.......................
is a British subject and is certified by the local Superintendent of the Marconi Wireless

Telegraph Company of Canada to have the necessary technical proficiency for the position of wireless operator having acted as such on the steamer.......................... plying upon the territorial waters of Newfoundland from..................................... to...

He has subscribed to the Oath of Secrecy and understands that this certificate is a provisional one, valid for not more than six months from the date of issue inscribed hereon.

Issued in accordance with the London Convention, 1912, and the Wireless Telegraphy (Steamers) Act, 1914, Newfoundland Legislature, and regulations made thereunder.

General Post Office,
St. John's, Newfoundland.

......day of........................

....

Minister of Posts and Telegraphs, Newfoundland.

AMATEUR EXPERIMENTAL LICENSE.

192.... LICENSE No...........

DOMINION OF NEWFOUNDLAND.

LICENSE TO USE RADIOTELEGRAPHY.

F *Issued in accordance with the provisions of the London Convention,* 1912, *and the Post and Telegraphs Amendment Act,* 1906, *and these Regulations made thereunder.*

The herein named.................. resident of................................ herein called the licensee, is hereby licensed to establish and operate an experimental radiotelegraph station situated at........... ....for the term of one year commencing on the............day of........ and terminating on the..........day of...... and to instal and operate at such station the apparatus mentioned in the schedule hereto, on payment of the sum of One Dollar ($1) being the license fee for the privilege above named.

This license is subject to the said Act and Regulations and to the following terms, conditions and restrictions:—

1. In this license, the term "Minister" means the Minister of Posts and Telegraphs service for the time being.

2. (1) The licensee shall not establish, instal or operate any apparatus for radiotelegraphy, except the apparatus hereinafter called the "licensed apparatus" specified in the said schedule hereto, nor use wavelengths other than those specified therein.

(2) The licensee shall work the licensed apparatus solely for the purpose of conducting experiments in radiotelegraphy and for no other purpose whatever.

3. (1) The licensee shall so work the licensed apparatus as not to interfere with the working of any radiotelegraph station established in Newfoundland or the territorial waters abutting on the coasts of Newfoundland (whether on shore or on any ship), by or for the purposes of the Minister of any Department of His Majesty's Government or for commercial purposes and in particular with the sending or receipt of any messages between or at radiotelegraph stations established as aforesaid on land and radiotelegraph stations established on ships at sea.

3. (2) With a view to preventing such interference as aforesaid the licensee shall comply with all directions which shall be given to the licensee by the Minister and with all rules prescribed by the Minister for observance by his licensees:—

(*a*) With respect to all arrangements to be adopted for the purpose of securing syntonised apparatus or for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other radiotelegraph station;

(*b*) Generally with respect to avoiding interference between one radiotelegraph station and another.

4. The licensed apparatus shall not, without the consent of the Minister, be altered or modified in respect of any of the particulars mentioned in the schedule hereto.

5. (1) The coupling between the primary and the secondary circuits of the oscillation transformer shall not be closer than that which gives a difference of 5 per cent. between the mean wavelength and either of the two waves emitted by the coupled circuits.

5. (2) The logarithmic decrement per whole period, of the emitted waves, shall not exceed two-tenths.

6. The licensee shall not divulge to any person (other than the properly authorised officials of the Government or a competent legal tribunal) or make any use whatever of any message coming to the knowledge of the licensee and not intended for receipt by means of the licensed apparatus.

7. The Minister or his officers may, from time to time and at all reasonable times, enter upon the herein licensed station, for the purpose of inspection, and may inspect any apparatus fixed or in use in such station, for the purpose of sending and receiving messages by radiotelegraphy and all other telegraphic instruments and apparatus fixed or being in such stations and the working and user of such apparattus and telegraphic instruments respectively.

8. All apparatus used or intended to be used by the licensee shall be so erected, fixed, placed and used as not, either directly or by reason of the working or user thereof, to interfere with the efficient or convenient maintenance, working or user of any telegraphic line.

9. The licensee shall at all times indemnify the Minister against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of any injury arising from any act licensed or permitted by these presents.

10. The licensed apparatus shall only be worked by a person, or persons, holding an Amateur Experimental Certificate of Proficiency in Radiotelegraphy.

11. The licensed apparatus shall be operated in accordance with the Regulations issued by the Minister and in accordance with such provisions of the International Radiotelegraph Convention as are applicable to such operation.

12. Except with the consent in writing of the Minister, the licensee shall not assign or sublet this license.

13. (1) The Minister may at any time in his absolute discretion give notice in writing to determine these presents and the license or permission hereby given at the end of one calendar month from the date of such notice, and at the expiration of that period the license or permission hereby granted shall cease and determine accordingly, but without prejudice to any remedy of the Minister under any provision herein contained on the part of the licensee to be observed and performed.

(2) The licensee shall, if so required by the Minister, cease to use the licensed apparatus

for such period as may be specified by the Minister.

14. In case of any breach, non-observance or non-performance by or on the part of the licensee of any of the terms or conditions herein contained and on the part of the licensee to be observed and performed, then and in any such case, the Minister may, by writing, revoke and determine these presents and the licenses, powers and authorities hereinbefore granted, and thereupon these presents, and the said licenses, powers and authorities and each and every of them shall absolutely cease, determine and become void.

15. Nothing in these presents contained shall prejudice or affect the right of the Minister, from time to time, to establish, extend, maintain and work any system or systems of radiotelegraphic communication (whether of a like nature to those hereby licensed or otherwise) in such manner as he shall in his discretion think fit, neither shall anything herein contained prejudice or affect the right of the Minister, from time to time, to enter into agreements for or to grant licenses relative to the working and use of radiotelegraphs (whether of a like nature to those hereby licensed or otherwise), or the transmission of messages in any part of Newfoundland, by means of radiotelegraphy, with or to any person or persons whomsoever upon such terms as he shall, in his discretion, think fit.

16. Any notice, request or consent (whether expressed to be in writing or not), to be given by the Minister under these presents may be under the hand of any authorised officer, for the time being, of the Department of the Postal Telegraph Service, and may be served by sending the same by registered post letter to the licensee, and any notice to be given by the licensee, under these presents, may be served by sending the same by registered post letter addressed to the Minister of Posts and Telegraphs, St. John's Newfoundland.

....

Minister of Posts and Telegraphs.
St. John's, Newfoundland.
....day of.....................192
Department of the Postal Telegraphs, St. John's, Newfoundland.
Dated this........day of..........192

Schedule.

1. Name of station........................
2. Location ....
3. Call Signal ....
4. Classification of station under Regulation No. ....
5. Type of aerial..........................
6. Natural wavelength of aerial............
7. Transmitting wavelength................
8. Decrement per complete oscillation......
9. Characteristics of transmitting..........
10. Characteristics of receiver.............
11. Source of power........................
12. Maximum to be taken by transmitter......
13. If A.C. number of cycles................
14. Hours during which the station must not transmit.................... .....
15. Stations with which the licensed stations may communicate.......... ....
....

Minister of Posts and Telegraphs.
Department of the Postal Telegraph Service,
St. John's, Newfoundland.
Dated this........day of..........192....

Special Regulations for Amateur Experimental Stations.

1. At amateur experimental stations the power used measured at the terminals of the transformer must not exceed ½ kw.

2. The wavelengths which may be used vary with the distance between the licensed station and any commercial coast or land station or a route of navigation as follows :—

For transmission :—

Class I—Station located within five miles of a commercial coast or land station or a route of navigation, shall not use a transmitting wavelength greater than 50 metres.

Class II—Stations located more than five but less than 25 miles from a commercial coast or land station or a route of navigation, shall not use a transmitting wavelength greater than 100 metres.

Class III—Stations located more than 25 but less than 75 miles from a commercial coast or land station or route of navigation, shall not use a transmitting wavelength greater than 150 metres.

Class IV—Stations located more than 75 miles from a commercial coast or land station or route of navigation, shall not use a transmitting wavelength greater than 200 metres.

3. A distinctive call signal shall be allotted to each station commencing with the figure "8," *e.g.*, 8AA, 8AB, which signal must be sent not less than three times at the termination of every transmission.

4. The Regulations of the International Radiotelegraph Convention, where applicable, be observed by the station.

5. The station must take every precaution to prevent interference with the working of other stations.

6. The station, when operating, must listen for the signal "STP" which will indicate that an amateur experimental station is interfering with commercial business.

7. The latter signal will only be made use of by certain authorised Government stations and will not be used unless absolutely necessary. The signal "STP" will, whenever possible, be preceded by the call signal allotted to the amateur experimental station to which the interference is attributed and will be followed by the call signal of the Government station. On receipt of the "STP" signal, all amateur experimental stations will cease to operate until the Government station gives the signal "Cancel STP."

8. The aerial must be connected to the transmitting apparatus only when actual communication is in progress or when measurements are being taken. At all other times such as when the spark is being tested or sending is being practised the aerial must be disconnected.

NEW GUINEA

(See map on p. 146.)

NEW HEBRIDES

(See Pacific Islands.)

NEW ZEALAND

THE Dominion of New Zealand lies about 1,200 miles south-east of the mainland of Australia, and consists of three main islands in the South Pacific Ocean, known as the North, South, and Stewart Islands. They stretch between 33° 0′ and 53° 0′ S. latitude; their longitude varying from 160° 0′ E. to 173° 0′ W. The Colony includes several groups of smaller islands, and lying at some distance from those which form the centre of the Dominion.

The initial discovery is attributed to the Dutch explorer, Abel Jansen Tasman, who visited the South Island on December 13th, 1642. The first settlement of Europeans was made in 1814, British sovereignty was proclaimed in 1840, and the independence of the Colony dates from May 3rd, 1841. The constitution rests upon the Act of 1852, under which the Executive authority is vested in a Governor-General assisted by a Council of Ministers with a legislature of two houses.

CONTROL.

The Post and Telegraph Department is responsible for the administration of wireless telegraphy in New Zealand. The permanent head of this Department is the Secretary of the General Post Office at Wellington.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Hon. Mr. J. G. Coates	Postermaster-General and Minister of Telegraphs.	Wellington
Mr. R. B. Morris	Secretary, Post and Telegraph Department	Wellington
Mr. A. T. Markman	First Assistant Secretary	Wellington
Mr. G. McNamara	Assistant Secretary	Wellington
Mr. E. A. Shrimpton, M.I.E.E. ..	Chief Telegraph Engineer	Wellington
Mr. A. Gibbs, A.M.I.E.E. ..	Deputy Chief Telegraph Engineer	Wellington
Mr. H. A. Huggins	Controller of Savings Bank and Accounts	Wellington

Licenses are granted for amateur or experimental stations in New Zealand, but the erection of receiving stations only are permitted.

ORGANISATION.

The first wireless installation was placed in the tower of the General Post Office at Wellington in June, 1910, and experiments were carried out with different wireless systems. Later on a "Telefunken" set was installed, and a wireless telegraph office opened for commercial work on July 26th, 1911. At that time there were not more than half a dozen ships fitted with wireless apparatus trading to the Dominion; now the majority of New Zealand ships carry wireless apparatus, as well as a large number of vessels registered in other countries and trading to New Zealand ports.

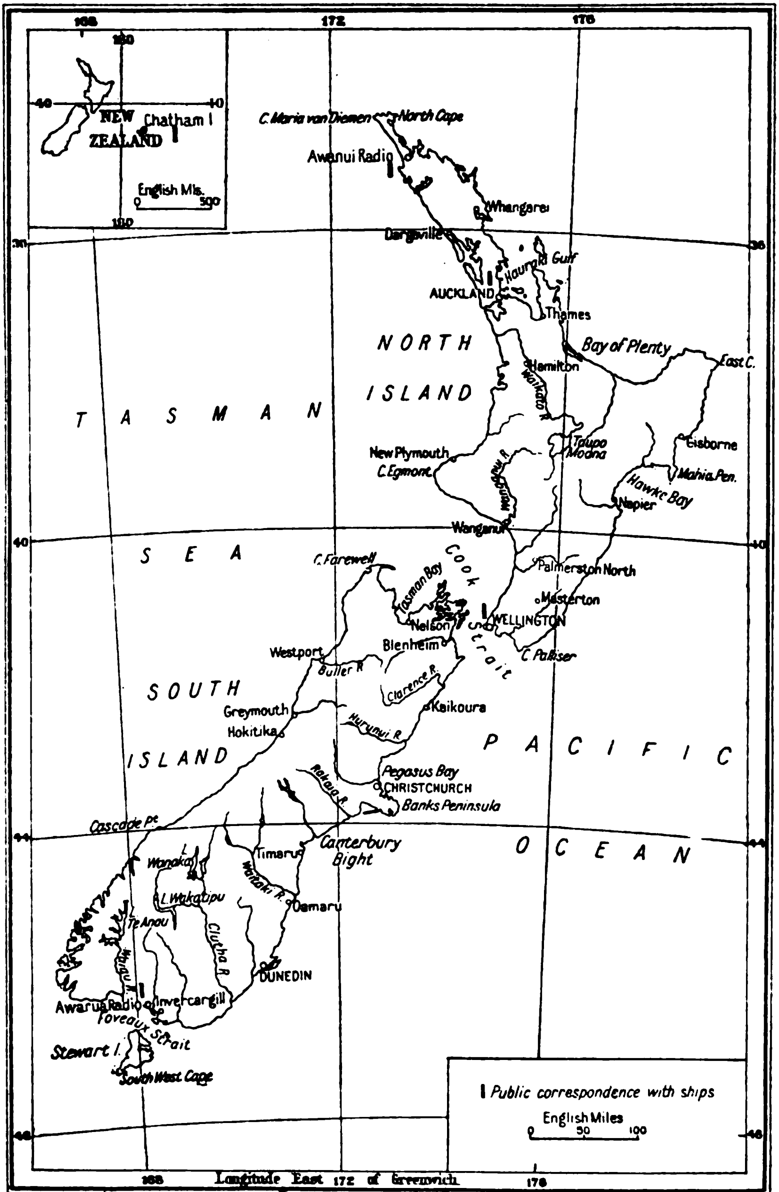
On October 14th, 1912, the G.P.O. station was replaced by one of 2½-kw. upon Mount Wakefield, immediately behind the City of Wellington. At this station, known as "Radio-Wellington," a continuous service is maintained.

On October 24th, 1912, a 2½-kw. station was established on the roof of the Post Office at Auckland. The normal range of these 2½-kw. stations is 300 miles by day and 600 miles by night.

The installation of a wireless set of 2½-kw. power on the Government cable steamer *Tutanekai* was completed on June 20th, 1912. The equipment has been found to be of much service in aiding in the work of the repair of submarine cables.

A wireless station was opened at CHATHAM ISLANDS on September 18th, 1913, connecting this group of islands with the mainland of New Zealand and extending the range of communication eastward.

The high-power stations at Awanui and Awarua were opened for public business on December 18th, 1913. These stations are of 30 kw. primary power Telefunken system, and were undertaken primarily for defence purposes.


NEW ZEALAND
Chatham I
English Mls.
C. Maria van Diemen
North Cape
Awanui Radio
Whangarei
Dargaville
Hauraki Gulf
AUCKLAND
Thames
NORTH ISLAND
Bay of Plenty
East C.
Hamilton
Waikato R.
TASMAN SEA
Taupo
New Plymouth
C. Egmont
Gisborne
Mahia Pen.
Hawke Bay
Napier
Wanganui
C. Farewell
Cook Strait
Palmerston North
Tasman Bay
Masterton
Nelson
WELLINGTON
Blenheim
C. Palliser
Westport
Buller R.
Clarence R.
SOUTH ISLAND
Greymouth
Kaikoura
Hokitika
Hurunui R.
PACIFIC OCEAN
Pegasus Bay
CHRISTCHURCH
Banks Peninsula
Rakaia R.
Cascade Pt.
Canterbury Bight
Timaru
L. Wanaka
Waitaki R.
L. Wakatipu
Oamaru
Te Anau
Clutha R.
DUNEDIN
Awarua Radio
Invercargill
Foveaux Strait
Stewart I.
South West Cape
Public correspondence with ships
English Miles
Longitude East of Greenwich

They are required to communicate with Sydney during the day as well as at night. The high power station at Apia (Samoa) and the low power station at Ravotouga (Cook Islands) are under the control of the New Zealand Government.

At the present time five stations in New Zealand are open for public service with ships.

ADMINISTRATION.

In July, 1914, regulations were made for the control of ships carrying wireless telegraph apparatus while within the territorial waters of New Zealand. The Regulations relating to ship stations were also amended by new Regulations issued on September 7th, 1914.

A—Extracts from the Post and Telegraph Act (Part X), 1908.
B—Extracts from Amendment Acts of 1911, 1913, and 1920.
C—Regulations under Act of 1913. (Ships not registered in NewZealand.)
D—Regulations (affecting ships registered in New Zealand).
E—Regulations as to ships being provided with Wireless (October, 1913).
F—Form of Ship License.
G—Provisional Permit for Wireless Receiving Apparatus.

POSTS AND TELEGRAPHS ACT.

A The following extracts from Part X of the Post and Telegraph Act, 1908, and from the Post and Telegraph Amendment Acts, 1911, 1913, and 1920, relate to wireless telegraphy in the Dominion:—

162. The Governor may from time to time establish stations for the purpose of receiving and transmitting telegraph messages within New Zealand or between New Zealand and parts beyond New Zealand by what is commonly known as "wireless telegraphy," including in that expression every method of transmitting messages by electricity otherwise than by wires, whether such method is in use at the time of the coming into operation of this Act, or is hereafter discovered or applied.

163. The provisions of Part VII of this division of this Act shall, as far as is applicable, *mutatis mutandis*, extend and apply to stations established under this part of this Act, and to communications by wireless telegraphy.

164. Every person who erects, constructs, or establishes any station or plant capable of transmitting or receiving wireless telegraphic signals otherwise than in accordance with a license granted by him in that behalf by the Minister of Telegraphs is liable to a fine not exceeding five hundred pounds, and any plant, machinery, instruments, and material used by him for such purpose may be forfeited and dealt with as the Minister directs.

Part VII of this division of the Act referred to deals with the construction and regulation of electric lines. It authorises the Governor to establish electric lines and purchase lines and plant. He may make regulations as to the management, working and maintenance of any telegraph. Any officer or person employed in the working of any telegraph who improperly divulges the contents of any telegram transmitted or presented for transmission by such telegraph, or the purport of such telegram, is liable to a fine not exceeding one hundred pounds, or to imprisonment with hard labour for any period not exceeding six months.

EXTRACTS FROM AMENDMENT ACTS OF 1911, 1913 AND 1920.

POST AND TELEGRAPH (AMENDMENT) ACTS, 1911 AND 1920.

B The Minister of Telegraphs may, in accordance with regulations to be made in that behalf by the Governor-General in Council, grant licenses to any person, association, or corporation for the installation and working within New Zealand, or on board any ship registered in New Zealand, of apparatus for wireless telegraphy, within the meaning of Part X of the original Act.

(2) Subject to any such regulation, every such license shall be in such form and for such period and shall contain such terms, conditions, and restrictions, as the Minister of Telegraphs thinks fit.

(3) The Governor may by Order in Council make such regulation as he thinks proper as to the granting of such licenses, and as to the form, period, terms, conditions, and restrictions thereof and as to the fees payable in respect thereof.

POST AND TELEGRAPH (AMENDMENT) ACT 1913.

9. (1) The Governor may from time to time, by Order in Council, make such regulations as he thinks proper governing the use of wireless telegraph apparatus on merchant ships whether foreign ships or British ships not registered in New Zealand, while within the territorial waters of New Zealand.

(2) Such regulations may provide for the detention of any merchant ship on which a breach of the regulations has been made, pending the institution and determination of proceedings in respect of such breach and the recovery of any fine imposed in respect thereof.

REGULATIONS UNDER ACT OF 1913.

AFFECTING SHIPS NOT REGULATED IN NEW ZEALAND.

C The following regulations are for the control of ships carrying wireless telegraph apparatus while within territorial waters of New Zealand.

Whereas by Section 9 of the Post and Telegraph Amendment Act 1913 (hereinafter

termed "the said Act"), it is provided that the Governor may from time to time by Order in Council make such regulations as he thinks proper governing the use of wireless telegraph apparatus on merchant ships, whether foreign ships or British ships not registered in New Zealand, while within the territorial waters of New Zealand, and that such regulations may provide for the detention of any merchant ship on which a breach of the regulations has been made pending the institution and determination of proceedings in respect of such breach and the recovery of any fine imposed in respect thereof.

Now, therefore, His Excellency the Governor of the Dominion of New Zealand, in pursuance and exercise of the power and authority conferred upon him by the said Act, and acting by and with the advice and consent of the Executive Council of the said Dominion, doth hereby make the following regulations; and doth hereby order that such regulations shall have effect on and from the date of publication of this Order in Council in the *New Zealand Gazette*.

FURTHER REGULATIONS.

1. In these regulations, if not inconsistent with the context:—

"Territorial waters of New Zealand" means and includes all tidal waters included within the Dominion of New Zealand, and all parts of the open sea within one marine league of the coasts of that Dominion measured from low-water mark.

"Minister of Telegraphs" means the Minister of Telegraphs for the time being.

"Wireless Telegraphy" has the same meaning as in Section 162 of the Post and Telegraph Act, 1908.

"Telegraph" has the same meaning as in Section 119 of the Post and Telegraph Act, 1908.

"Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station, whether a coast station or a ship station.

"The Admiralty" means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

"Coast station" means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

"Ship station" means a wireless telegraph station established on board a ship which is not permanently moored.

2. These regulations shall apply only to foreign merchant ships and to British merchant ships not registered in New Zealand, while such British or foreign ships are within the territorial waters of New Zealand.

3. All apparatus for wireless telegraphy on board a merchant ship while in the territorial waters of New Zealand shall be worked in such a way as not to interfere with Naval signalling, or with the working of any wireless telegraph station lawfully established, installed or worked in the Dominion of New Zealand or the territorial waters thereof; and, in particular, the said apparatus shall be so worked as not to interrupt or interfere with the transmission of messages between wireless telegraph stations established on ships at sea and wireless telegraph coast stations.

4. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any of the harbours of the Dominion of New Zealand, except with the consent in writing of the Minister of Telegraphs.

5. The foregoing regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

6. If and whenever an emergency shall have arisen in which it is expedient in the public interest that His Majesty's Government shall have control over the transmission of messages by the said apparatus, it shall be lawful for any officer of His Majesty's Navy or Army, or for any other person authorised in that behalf by the Admiralty, or by the Minister of Telegraphs, to take possession of or to cause the said apparatus or any part thereof to be taken possession of in the name and on behalf of His Majesty, and to be used for His Majesty's service and subject thereto for such ordinary services as to the said officer or person may seem fit; and in that event any person authorised by the said officer or person may enter upon any ship on which such apparatus is installed and take possession of the said apparatus and use the same as aforesaid.

7. Any such officer or person may in such event as aforesaid, instead of taking possession of the said apparatus as aforesaid, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the said apparatus, either wholly or partly, and in such manner as he may direct, and such persons may enter upon any ship on which the said apparatus is installed accordingly; or the said officer or person may direct the person or persons in charge of the said apparatus to submit to him, or any person authorised by him, all messages tendered for transmission or arriving by the said apparatus, or any class or classes of such messages, to stop or delay the transmission of any messages, or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said officer or person may prescribe, and the said person or persons in charge of the said apparatus shall obey and conform to all such directions.

8. If any breach of these regulations is committed by any person on board any ship while in the territorial waters of New Zealand, the person so committing the same and the owner and master of the ship shall be severally liable on summary conviction to a fine not exceeding £100.

9. Whenever the Minister of Telegraphs or the Secretary of the Post Office has reasonable cause to believe or suspect that any breach of these regulations has been committed on board any ship while in the territorial waters of New Zealand, he may give notice in writing to the Collector of Customs at any port in New Zealand to detain the ship, under Section 9 of the Post and Telegraph Amendment Act, 1913, until the sum of £100, or such smaller sum as may be specified in the notice, has been deposited with the collector by or on behalf of the owner of the ship.

10. If on the receipt of that notice, or at any time within three months thereafter, the ship is found within such port, the Collector of Customs shall withhold the certificate of

clearance of the ship, under Section 35 of the Customs Act, 1913, until and unless the aforesaid sum is deposited with him or the aforesaid notice of detention is withdrawn.

11. If within six months after the date of the offence in respect of which the ship has been detained a conviction for that offence is obtained against any person, the sum so deposited shall be available for the satisfaction of any fine and costs imposed or awarded by the conviction, and the residue, if any, shall be returned to the person by whom the deposit was made.

12. If within the period of six months aforesaid no such conviction is obtained, the sum so deposited shall be returned to the person by whom it was deposited.

WIRELESS TELEGRAPH REGULATIONS FOR SHIP STATIONS.

Affecting Ships Registered in New Zealand.

Whereas by Order in Council dated the twentieth day of November, one thousand nine hundred and eleven and published in the *New Zealand Gazette* of the twenty-third day of November, one thousand nine hundred and eleven, regulations were made under the authority of the Post and Telegraph Amendment Act, 1911 (hereinafter termed " the said Act "), as to the granting of licenses for the installation and working of apparatus for wireless telegraphy on board any ship registered in New Zealand, and whether on the high seas or in New Zealand waters, and as to the form, period, terms, conditions, and restrictions thereof, and as to the fees payable in respect thereof: And whereas it is desirable to revoke such regulations, and to make others in lieu thereof.

Now, therefore, His Excellency the Governor of the Dominion of New Zealand, in pursuance and exercise of the power and authority conferred upon him by the said Act, and of all other powers and authorities in that behalf enabling him, and acting by and with the advice and consent of the Executive Council, of the said Dominion, doth hereby revoke the regulations made by the above-mentioned Order in Council, and in lieu thereof doth hereby make the following regulations for the purposes hereinbefore mentioned; and doth hereby order that such regulations and the revocation of the regulations first before recited shall have effect on and from the date of publication of this Order in Council in the *New Zealand Gazette*.

Regulations.

1. In these regulations, if not inconsistent with the context :—

" Minister of Telegraphs " means the Minister of Telegraphs for the time being.

" Wireless Telegraphy " has the same meaning as in Section 162 of the Post and Telegraph Act, 1908.

" Telegraph " has the same meaning as in Section 119 of the Post and Telegraph Act 1908.

" Naval signalling " means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station, whether a coast station or a ship station.

" The Admiralty " means the Commissioners for executing the office of Lord High Admiral of the United Kingdom of Great Britain and Ireland.

" The International Telegraph Convention " and the " International Telegraph Regulations " means respectively the International Convention of St. Petersburg dated the 10th-22nd July, 1875, and the service regulations made thereunder; and include respectively any modifications of the convention or regulations made from time to time.

" The Radiotelegraph Convention, 1912," means the convention signed at London on the 5th day of July, 1912, and the service regulations made thereunder; and includes any modification of the convention or regulations made from time to time.

" Coast station " means a wireless telegraph station which is established on land or on board a ship permanently moored, and which is open for the service of correspondence between the land and ships at sea.

" Ship station " means a wireless telegraph station established on board a ship which is not permanently moored.

2. The Minister of Telegraphs may, at the request of any person or company desirous of establishing, installing, working, and using on ships belonging to such person or company, and registered in New Zealand, apparatus for wireless telegraphy, grant to such person or company (hereinafter called " the licensee ") a licence, in the form of the Schedule hereto, for the period, upon the terms, and subject to the conditions and restrictions hereinafter appearing.

3. Each ship station is bound to exchange radiotelegrams with any coast station, or with any other ship station, without distinction as to the radiotelegraph system adopted by that station.

4. Each ship station shall be of such class mentioned in Article 13 of the Service Regulations annexed to the Radiotelegraph Convention, 1912, as is specified in the license issued in respect thereof, and the equipment of the station, hours of duty observed, and other requirements shall be appropriate to such class in accordance with the provisions of the Radiotelegraph Convention, 1912.

5. The apparatus used at all ship stations shall, as far as possible, be in keeping with scientific and technical progress. The waves emitted must be as pure and as little damped as possible.

6. The apparatus must be capable of transmitting and receiving at a speed of at least equal to twenty words per minute, the word being reckoned at the rate of five letters.

7. The apparatus shall be so constructed as to be capable of using wavelengths of 600 to 300 metres as measured by the standard of measurement in use by the Post and Telegraph Department for the time being; and such other wavelengths not exceeding 600 metres as shall be authorised from time to time by the Minister of Telegraphs; Provided always that the wavelength of 600 metres shall normally be used for communication, and, further, that the wavelength of 1,800 metres may be used for transmission in the exceptional case referred to by Article 35 (2) (*a*) of the Service Regulations annexed to the Radiotelegraph Convention, 1912; Provided, further, that only wavelengths of 600 metres shall be used by

SC

LICENSE FOR THE INSTALLATION AND WORKING OF APP

Name of Ship on which Station established.	Class of Ship Station under the Radio-telegraph Convention, 1912.	Call Signal.	Nature of Services Performed.	Hours of Service.	Normal Range of Signalling in Nautical Miles.	
					By Night.	By Day.
(1)	(2)	(3)	(4)	(5)	(6)	(7)

the licensee during the period of any war in which the United Kingdom is engaged.

8. The licensed apparatus shall not be used by the licensee, or by any other person either on behalf or by permission of the licensee, for the transmission or receipt of messages except messages authorised by these regulations; and the licensee shall not, except with the consent in writing of the Minister of Telegraphs, send or receive messages from or at the licensed apparatus when in any harbour in the Dominion of New Zealand.

9. (1) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus, interfere with naval signalling.

(2) If the Admiralty are of opinion that the working of the licensed apparatus at any ship station is inconsistent with the free use of naval signalling, the licensee shall, when required in writing by the Minister of Telegraphs so to do, close the said station.

(3) These provisions for the protection of naval signalling shall be construed to be without prejudice to the generality of any other provisions of the license.

10. The licensee shall observe the International Telegraph Convention and International Telegraph Regulations so far as the said convention and regulations are capable of being applied to wireless telegraphy in common with ordinary land and submarine telegraphy.

11. The licensee shall observe the provisions of any regulations from time to time made under the provisions of the Post and Telegraph Act, 1908, and its amendments, by the Governor in Council or by the Minister of Telegraphs in relation to the conduct of wireless telegraph business, so far as the same are applicable to the licensee.

12. The licensee shall observe the provisions of the Radiotelegraph Convention, 1912.

13. The licensee shall comply with all such directions and observe all such rules as may be given or made by the Minister of Telegraphs from time to time for the purpose of preventing interference with the working of any other wireless telegraph station, and for enabling the messages exchanged by means of the licensed apparatus to be distinguished from those emanating from any other wireless telegraph station.

14. The licensed apparatus shall not, without the consent of the Minister of Telegraphs be altered or modified in respect of any of the particulars referred to in the license issued in respect thereof, and such apparatus shall at all times be maintained in good working order.

15. Except as provided in these regulations, the licensee shall transmit messages by means of the licensed apparatus on equal terms, without favour or preference, whether as regards rates of charge, order of transmission, or otherwise.

16. The licensee shall, so far as possible, receive from ships and light stations all requests for assistance and all signals of distress, and shall answer such requests and signals and retransmit them with the least possible delay, and with priority over all other messages to the proper authorities by means of the licensed apparatus or by any other means in the power of the licensee.

17. The licensed apparatus at ship stations shall be worked only by a person or persons holding a certificate or certificates issued or recognised by the Minister of Telegraphs. Certificates shall be granted to persons of British nationality possessing the qualifications prescribed by the Radiotelegraph Convention, 1912, and shall be in such form and subject to such conditions, directions, or rules as the Minister of Telegraphs shall from time to time prescribe: and such certificates may at any time be withdrawn at the discretion of the Minister of Telegraphs in case of misconduct, or breach on the part of the holder of the Radiotelegraph Convention, 1912, or of any conditions, directions, or rules prescribed by the Minister of Telegraphs for the guidance of operators or for the working of such ship stations.

DULE.

[...]S FOR WIRELESS TELEGRAPHY ON BOARD SHIPS OWNED BY

Character of Apparatus.		Power.		
System of Radiotelegraphy with the Characteristics of the System of Emission.	Wave-lengths (in Metres).	Source and Maximum Output.	Maximum to be normally taken by Sending Instruments.	If Alternator is used Number of Cycles per Second.
(8)	(9)	(10)	(11)	(12)

18. (1) The licensee, his servants and agents, shall not divulge the contents or the purport of the contents of any message, or make any use whatever of any message coming to his or their knowledge, other than to the addressee or his authorised agent, or to properly authorised officials of His Majesty's Government or of the Minister of Telegraphs, or to a competent legal tribunal.

(2) The licensee shall render to the Minister of Telegraphs such accounts as the Minister of Telegraphs shall direct in respect of all charges due or payable under the Radiotelegraph Convention, 1912, in respect of messages exchanged between the licensed ship stations and coast stations, and shall pay to the Minister of Telegraphs, at such times and in such manner as the Minister of Telegraphs shall direct, all sums which shall be due from the licensee under such accounts.

19. The licensee shall keep full accounts, records, and registers of all messages transmitted by means of the licensed apparatus; and in such registers each of such messages shall be accompanied by its identifying number and date, and full particulars of its place of origin and of ultimate destination, and such further particulars as the Minister of Telegraphs shall from time to time reasonably require to be shown. The licensee shall preserve all used message forms written and printed, and transcripts of messages, and all other papers for such period as is from time to time prescribed by the Radiotelegraph Convention, 1912, and, in default of any provisions on the subject in the said convention, for such period as is from time to time prescribed by the International Telegraph Regulations; and such registers and message papers shall be open to the inspection of the Minister of Telegraphs or his authorised officers.

20. The Minister of Telegraphs, and any agent authorised in that behalf in writing by him, may at all reasonable times enter upon any licensed ship station for the purpose of inspecting, and may inspect, any apparatus fixed or being in such station for the purpose of sending and receiving messages by wireless telegraphy, and all other telegraphic instruments and apparatus fixed or being in such station, and the working and user of such apparatus and telegraphic instruments.

21. The licensee shall carry on every ship on which a ship station is established a print or copy of the license, certified under the hand of an appropriate officer of the Minister of Telegraphs to be a true copy, and shall produce such print or copy for inspection if required to do so by the competent authorities of the countries where the ship calls, and also such documents as may be prescribed by the Minister of Telegraphs for the purpose of enabling the licensee to communicate with coast stations and ship stations, in accordance with the Radiotelegraph Convention, 1912.

22. (1) Every license shall be in force from the date of the granting thereof until the 31st December of the year in which it is issued, and no longer; but may be renewed from year to year.

(2) The licensee shall pay to the Minister of Telegraphs for and in respect of the license granted, and of every renewal thereof, a royalty of 5s. in respect of each ship station included in the license.

(3) All royalties payable under any license shall be payable on the date of the granting or renewal thereof, as the case may be.

23. Except with the consent in writing of the Minister of Telegraphs, the licensee shall not assign, underlet, or otherwise dispose of or admit any other person or body to participate in the benefit of any license.

24. If and whenever an emergency shall have arisen in which it is expedient in the public interest that His Majesty's Government shall have control over the transmission of messages by the licensed apparatus, it shall be lawful for any officer of His Majesty's Navy or Army, or for any other person authorised in that behalf by the Admiralty, or by the Minister of Telegraphs, to take possession of or to cause the licensed apparatus or any part thereof to be taken possession of in the name and on behalf

of His Majesty, and to be used for His Majesty's service and subject thereto for such ordinary services as to the said officer or person may seem fit; and in that event any person authorised by the said officer or person may enter upon any ship on which any such apparatus is installed and take possession of the said apparatus and use the same as aforesaid.

25. Any such officer or person may in such event as aforesaid, instead of taking possession of the licensed apparatus as aforesaid, direct and authorise such persons as he may think fit to assume the control of the transmission of messages by the licensed apparatus either wholly or partly and in such manner as he may direct, and such persons may enter upon any ship on which any apparatus is installed accordingly; or the said officer or person may direct the licensee, his servants or agents, to submit to him, or any person authorised by him, all messages tendered for transmission or arriving by the licensed apparatus, or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him or his agent, and generally to obey all such directions with reference to the transmission of messages as the said officer or person may prescribe, and the licensee, his servants or agents, shall obey and conform to all such directions.

26. In any of the following cases, that is to say:—

(a) In case any sum of money which ought to be paid by the licensee to the Minister of Telegraphs under or by virtue of these regulations shall be in arrear and unpaid for one calendar month after the time at which the same ought to be paid under or by virtue of the provisions herein contained; or

(b) In case of any breach, non-observance, or non-performance by or on the part of the licenses, his servants or agents, of any of the provisions (other than a provision for the payment of money) or conditions herein contained,—

then and in any such case the Minister of Telegraphs may, by notice in writing, revoke and determine the license as to all or any of the ship stations thereby licensed, and thereupon the said license shall absolutely cease, determine, and become void as to all or any of the said ship stations, as the case may be, but without prejudice to any right of action or remedy which shall have accrued to His Majesty under these regulations or otherwise.

27. Nothing in these regulations shall prejudice or affect the right of the Minister of Telegraphs from time to time to establish, extend, maintain, and work any system or systems of telegraphic communication (whether of a like nature to those licensed hereunder or otherwise) in such manner as he shall in his discretion think fit. Neither shall anything herein contained prejudice or affect the right of the Minister of Telegraphs from time to time to enter into agreements for or to grant licenses relative to the working and use of telegraphs (whether of a like nature to those licensed hereunder or otherwise) or the transmission of messages in any part of New Zealand by means of wireless telegraphy, or by any other means, with or to any person or persons whomsoever, upon such terms as he shall in his discretion think fit. And (save as in these regulations expressly provided) nothing herein contained shall be deemed to authorise the licensee to exercise any of the powers or authorities conferred on or acquired by the Minister of Telegraphs by or under the Post and Telegraph Act, 1908.

28. Any notice, request, or consent (whether required to be in writing or not) to be given by the Minister of Telegraphs under these regulations may be under the hand of the Secretary for the time being of the Post and Telegraph Department, and may be served by sending the same in a registered letter addressed to the licensee at the office or place of residence for the time being of the licensee, or, if such notice, request, or consent relates to any particular ship station, by delivery to the master of the ship upon which such station is installed; and any notice to be given by the licensee under these regulations may be served by sending the same in a registered letter addressed to the Secretary, General Post Office, Wellington.

29 All licenses heretofore issued under the regulations hereby revoked shall continue in force, subject to the regulations under which they were issued, until the expiry of the current term thereof, but shall not be capable of renewal under the regulations so revoked.

REGULATIONS

as to Ships being provided with Wireless Telegraphy Apparatus.

Order in Council.

E

At the Government House, at Wellington, this twentieth day of October, 1913.

Whereas it is enacted by Section 50 of the Shipping and Seamen Amendment Act, 1909, that the Governor may from time to time by Order in Council make regulations requiring ships registered in New Zealand, and carrying passengers, to be provided with apparatus for transmitting messages by means of wireless telegraphy, and may by such regulations prescribe fines not exceeding fifty pounds for any breach thereof by the owner or master of a ship. And whereas it is desirable to make such regulations:

Now, therefore, His Excellency the Governor of the Dominion of New Zealand, in exercise of the hereinbefore recited power and authority, and acting by and with the advice and consent of the Executive Council of the said Dominion, doth hereby make the following regulations, and doth hereby order that they shall come into force on July 1st, 1914:

Provided that, if in his opinion the circumstances justify it, the Minister of Marine may exempt any steamship from the operation of these regulations, and may limit the time for which any such exemption shall be in force.

Regulations.

1. Every steamship registered in New Zealand, and carrying passengers, which is engaged in the foreign or inter-colonial trade, except steamships trading to the Chatham, Auckland, Campbell, and Antipodes Islands, and every home trade steamship which is authorised by her ordinary survey certificate to carry not less than 150 passengers at sea, shall not leave or attempt to leave any port in New Zealand unless such steamship is equipped with an efficient apparatus for radio communication in good working order, to be operated by a person skilled in the use of such apparatus, which apparatus shall be capable of transmitting and receiving messages over a distance of at least one hundred miles, day or night.

2. Ships required by these regulations to carry the apparatus prescribed above shall be placed in the third class as defined by Article XIII of the Detailed Service Regulations, appended to the International Radiotelegraph Convention, 1912—that is, they are not bound to perform any regular listening service.

3. The Minister of Marine may appoint inspectors for the purposes of these regulations, and such inspectors and superintendents of Mercantile Marine may visit any steamship required by these regulations to be equipped with apparatus for radio communication before they leave port, and ascertain if they are equipped with such apparatus the operation of which shall be carried out by a telegraphist holding a certificate as prescribed by Article X of the Detailed Service Regulations attached to the International Radiotelegraphic Convention.

4. Where a passenger steamship subject to these regulations is without the apparatus and the operator prescribed, and is about to attempt to leave port, an inspector or superintendent shall :—

(*a*) Notify the master of the fine to which he will be liable and of the particulars in respect of which the law has not been complied with;

(*b*) Notify at once the Collector of Customs, who may thereupon withhold the vessel's clearance until the requirements of these regulations are complied with;

(*c*) Prepare a report in writing of his action and transmit it to the Collector of Customs, who shall forward a copy to the Secretary of the Marine Department.

5. An inspector or superintendent may, at any time before a vessel subject to these regulations leaves port, require the master to give him a certificate, in the form set forth in the appendix hereto, that the wireless apparatus of his ship is sufficient and in good working order, and the master shall give such certificate before the vessel leaves port.

6. The power necessary to transmit signals shall at all times, while the vessel is under way be available for the wireless operator's use.

7. Subject to the above regulations, the installation and operation of the apparatus required by them to be fitted shall be in conformity with the requirements of the Post and Telegraph Act, 1908, and its amendments, and the regulations made thereunder.

8. Any master or owner of a steamship committing a breach of these regulations is liable to a fine not exceeding £50.

Appendix.

This is to certify that the wireless operator in principal charge of the apparatus for radio-communication on the s.s. " " has this day certified to me in writing that the said apparatus is efficient and in good working order.

(Signed)

Master.

LICENSE TO ESTABLISH WIRELESS TELEGRAPH SHIP STATION.

F

In pursuance and exercise of the power and authority conferred upon me by section 3 of the Post and Telegraph Amendment Act, 1911, I Minister of Telegraphs of the Dominion of New Zealand, hereby grant a license to for the installation and working of apparatus for wireless telegraphy (within the meaning of Part X of the Post and Telegraph Act, 1908), on board the ship or ships named in the Schedule hereto, and subject to the regulations providing for the working of wireless telegraphy on ship stations made by Order in Council of the seventh day of September, 1914, a copy of which is printed hereon.

Given under my hand, at Wellington, this day of , 19

....

Minister of Telegraphs

Entered in the Register of Warrants of the Minister of Telegraphs, this day of , 19

....

Secretary, Post and Telegraph Department.

SCHEDULE.

License for the Installation and Working of Apparatus for Wireless Telegraphy on Board Ships Owned by

Name of Ship on which Station established.	Class of Ship Station under the Radiotelegraph Convention, 1912.	Call Signal.	Nature of Services performed.	Hours of Service.	Normal Range of Signalling in Nautical Miles.		Character of Apparatus.		Power.		
					By Night.	By Day.	System of Radio-telegraphy, with the Characteristics of the System of Emission.	Wavelengths (in Metres).	Source & Maximum Output.	Maximum to be normally taken by Sending-instruments.	If Alternator is used, Number of Cycles per Second.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

POST AND TELEGRAPH DEPARTMENT.
PROVISIONAL PERMIT ISSUED BY THE MINISTER OF TELEGRAPHS.

G AUTHORISING THE USE OF WIRELESS RECEIVING APPARATUS FOR EXPERIMENTAL OR INSTRUCTIONAL PURPOSES AS INDICATED HEREON.

PARTICULARS REGARDING PERMITTEE AND APPARATUS.

Name of person to whom the permit is issued, and where applicable, the body on whose behalf the permit is held :—

Address :
Location of apparatus :—
Purpose for which apparatus authorised (experimental or instructional) :

THIS PERMIT authorises the person or body referred to herein to use for experimental/instructional purposes wireless receiving apparatus subject to the conditions hereinafter mentioned. The Permit is a provisional one and will subsequently be replaced, where circumstances justify the same, by a license.

The Permit is subject to withdrawal or cancellation at any time when, in the opinion of the Minister of Telegraphs, such action becomes necessary.

Any breach of the conditions referred to will result in withdrawal or cancellation of the Permit and will be regarded *per se* as indicating the unfitness of the Permittee to receive a regular license.

While it is the intention to give every reasonable facility to persons or bodies who are in any way likely to further the interests of wireless science or of radio communication, and who are not actuated solely by motives of amusement, it should be distinctly understood that the Minister of Telegraphs is charged *inter alia* with the responsibility for the uninterrupted carrying-on of the public radio services, for the secrecy of public radio correspondence, and for the reliable detection of Distress Signals upon which depends in a great measure the safety of life at sea. These facts render it imperative that the following conditions should be strictly observed, and Permittees are therefore enjoined to co-operate with the Post and Telegraph Department in every possible way with a view to ensuring the furtherance of the objects mentioned.

Secretary, Post and Telegraph Department
Date

Signature of Permittee.
Witness :
Radio Inspector.
Date :

CONDITIONS UNDER WHICH PERMIT IS ISSUED.

1. "*Radio Inspector*" in this Permit means the District Telegraph Engineer of the district in which the wireless receiving station is situated, or such officer or officers as may be deputed by him. "*Permittee*" means the person in whose name the Permit is issued, and who is held responsible for the due observance of the following conditions :—

2. *Object of Permit.*—This Permit authorises the use of the wireless receiving apparatus described in Schedule A, or such modification thereof as may subsequently be approved in writing by the Radio Inspector.

3. *Alterations to Apparatus.*—Any change that is contemplated in the type or characteristics of the receiving apparatus referred to in Schedule A must first be notified in writing to the Radio Inspector and be accompanied where necessary by descriptive diagrams. These changes must not be effected until the written sanction of the Radio Inspector has been obtained. This precaution is necessitated mainly on account of the highly "interfering" properties of valve receivers operating under certain conditions, and it should be clearly understood by Permittees authorised to use valve receivers that serious interference may actually result from the same within a radius of ten miles of a public radio station.

4. *Amateur Warning Signal.*—When using valve receivers within ten miles of a Government Radio Coast Station, Permittees must continually listen for the Amateur Warning Signal from such station—*viz.*, A.A.A.A.Q.R.M. (followed by a figure indicating minutes), and must immediately cease operations upon receipt of the same until the time indicated has expired. In this connection the greatest care must be exercised on the part of the Permittee to avoid interfering with the receipt and handling by radio stations open for public correspondence of the International Distress Signal, SOS.

5. *SOS Signals : Procedure.*—If, in connection with his use of the authorised apparatus any Distress Signals should come under the notice of the Permittee, and there is reason to believe that such signals have not been intercepted by a radio station open to public correspondence, the Permittee shall immediately take such steps as may be available (*e.g.*, by telephone) for communicating the same to the nearest Government radio station, or, if this be impracticable, to a responsible officer of the Post and Telegraph Department.

6. *Custody of Apparatus.*—The wireless apparatus authorised by this Permit shall be kept in secure custody, and no part of the same shall be removed from its authorised location without the approval of the Radio Inspector.

7. *Inspection of Apparatus.*—The wireless apparatus shall be subject to inspection by the Radio Inspector at all times, and every facility shall be given to such officer to carry out any inspection or test that may be considered necessary.

8. *Supervision by Permittee.*—The apparatus shall not be brought into operation for any purpose in the absence of the Permittee or apart from his supervision, and in order to safeguard this requirement the Permittee must see that Condition 6, requiring the apparatus to be kept in safe custody, is faithfully observed.

9. *Declaration of Secrecy.*—The Permittee shall be required to execute a Declaration of Secrecy which provides that he shall not divulge to any unauthorised person any information relating to public radio correspondence which may come to his knowledge, and that he will by every means in his power seek to preserve the secrecy of the same. Exception is made in the case of meteorological and time signals which are broadcasted for general information. Any breach of this condition will be seriously noticed. The Permittee shall not commit to writing any such public radio correspondence that may come to his knowledge, and shall be responsible for seeing that no unauthorised person is permitted to become acquainted with the same. In the case of bodies for whom the Permittee may be acting in a representative capacity, the latter shall be held responsible for satisfying the Radio Inspector that all members of the body having access to the apparatus shall first have executed

the Declaration of Secrecy. The apparatus shall be regarded as under the direct supervision of the Permittee, but, in order to facilitate the work of such body, the responsibility of supervision may be shared with one or more approved persons, as may be arranged in writing with the Radio Inspector. These responsible supervisors shall be present whenever the apparatus is being used, and shall supervise such use with the object of ensuring that all the conditions of the Permit, particularly those relating to the Amateur Warning Signal, to Distress Signals, and to the secrecy of public correspondence, are strictly observed.

10. *Log Record.*—The Permittee shall keep a log record showing the hours during which the authorised apparatus is in operation and embodying a record of the reception of any of the special signals referred to in Condition 4. This log shall be produced for perusal by the Radio Inspector whenever required.

11. *Temporary Disuse of Apparatus.*—Apart from the requirements of Condition 4, the use of the apparatus shall cease at any time and for any period that may be considered necessary by the Radio Inspector.

12. *Amendment of Conditions.*—The Permittee shall be prepared and shall be required to comply with any amended or additional conditions that circumstances may from time to time render it necessary to impose.

SCHEDULE A.

DESCRIPTION OF WIRELESS RECEIVING APPARATUS AUTHORISED UNDER THIS PERMIT.

NICARAGUA

THIS Central American State lies between Costa Rica on the south and Honduras on the north. Its area is estimated at 49,200 square miles, and it possesses a coast line of about 300 miles on the Atlantic, whilst that on the Pacific Ocean stretches for about 200 miles.

The present constitution came into force on April 5th, 1913. It vests the executive functions in a President, and the legislative power in a Congress of two houses. On February 18th, 1916, a treaty between Nicaragua and the United States was ratified, which laid down the conditions for the acquisition by the latter of naval bases on the Pacific and Atlantic coasts and of the projected canal route.

CONTROL.

The control of any stations which the Government might establish on its own account would be vested in the Minister of Progress and Public Works (*Ministerio de Fomento*) and the Postmaster-General.

ORGANISATION.

With regard to wireless telegraphy, none of the installations at present existing in Nicaragua is owned by the Government. The United States Government possesses a station in Managua, the capital of the Republic, and there are two stations owned by private companies on the Atlantic Coast.



Managua now Official Correspondence only.

These stations (with the exception of that owned by the American Government) have been erected under contract with the Government of the Republic, and are subject to the provisions of the London Radiotelegraphic Convention of 1912. Only one of them is open to public service with ships.

A small station has also been erected at the Eden Mines in Pis Pis mining district at the expense of the company, and is used exclusively by the firm.

ADMINISTRATION.

No special legislation bearing on the subject has been promulgated in the country. The above-mentioned convention constitutes the only law at present applicable to Nicaragua in the case of wireless telegraphy.

NIGERIA

THIS territory comprises the Colony and Protectorate of Nigeria and the approximate area is 336,000 square miles.

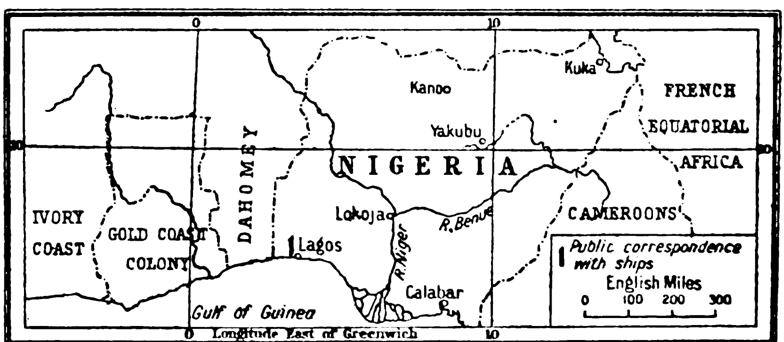
The Colony is practically identical with the old Colony of Lagos, and comprises an area of 1,400 square miles. The Protectorate is divided into the Northern and Southern Provinces, which almost coincide with the old Protectorate of Northern and Southern Nigeria.

The Governor and Commander-in-Chief of the Colony is *ex officio* the Governor and Commander-in-Chief of the Protectorate. The Northern and Southern Provinces are each administered by a Lieutenant-Governor. The Colony is administered by the Lieutenant-Governor of the Southern Province.

An Executive Council advises the Governor both for the Colony and Protectorate. The Legislative Council confines its operation to, and considers, the laws and estimates of the Colony. The Nigerian Council is an advisory and deliberate body.

CONTROL AND ORGANISATION.

There is only one wireless station in Nigeria—at Lagos—and this was erected by the African Direct Telegraph Company in 1912. It is open to public service with ships. The Postmaster-General controls the wireless services.



ADMINISTRATION.

Wireless telegraphy is administered under :—

A—The Wireless Telegraph Ordinance, 1916.

B—Regulations made under the Ordinance of 1916.

THE WIRELESS TELEGRAPHY ORDINANCE, 1916.

A 1. *Short Title.*—This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1916.

2. *Definition.*—Definition: "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received.

3. *License for Wireless Telegraphy.*—(1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in Nigeria except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. *Apparatus Aboard Ships to be Worked in Accordance with Regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of Nigeria, otherwise than in accordance with regulations made under this Ordinance.

5. *Regulations.*—(1) The Governor may make regulations for carrying into effect the purposes of this Ordinance.

(2) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of Nigeria shall be subject to such further Regulations as may be made by the Governor and such Regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf, or contrary to the provisions of any Regulations made under this Ordinance or of any license granted under this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by a superior officer and named in the warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. *Penalties and Procedure.*—Any person who shall offend against any provision of this Ordinance or any of the Regulations made thereunder shall be liable to a fine of fifty pounds, and the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

8. *Saving Section as Regards Electrical Apparatus.*—Nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than that of wireless telegraphy.

9. *Repeal No. 12 of 1913 of Southern Nigeria and Chapter 55 of the Laws of Northern Nigeria.*—The Wireless Telegraphy Ordinance, 1913, and the Wireless Telegraphy Proclamation are hereby repealed.

REGULATIONS MADE UNDER THE WIRELESS TELEGRAPHY ORDINANCE, 1916.

B The following Regulations are made by His Excellency the Governor-General under and by virtue of the provisions of section 5 of the Wireless Telegraphy Ordinance, 1916:—

1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of Nigeria shall be worked in such a way as not to interfere with:—

(*a*) Naval signalling, or

(*b*) the working of any wireless telegraph station lawfully established, installed or worked in Nigeria or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay or waters of Nigeria except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these Regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

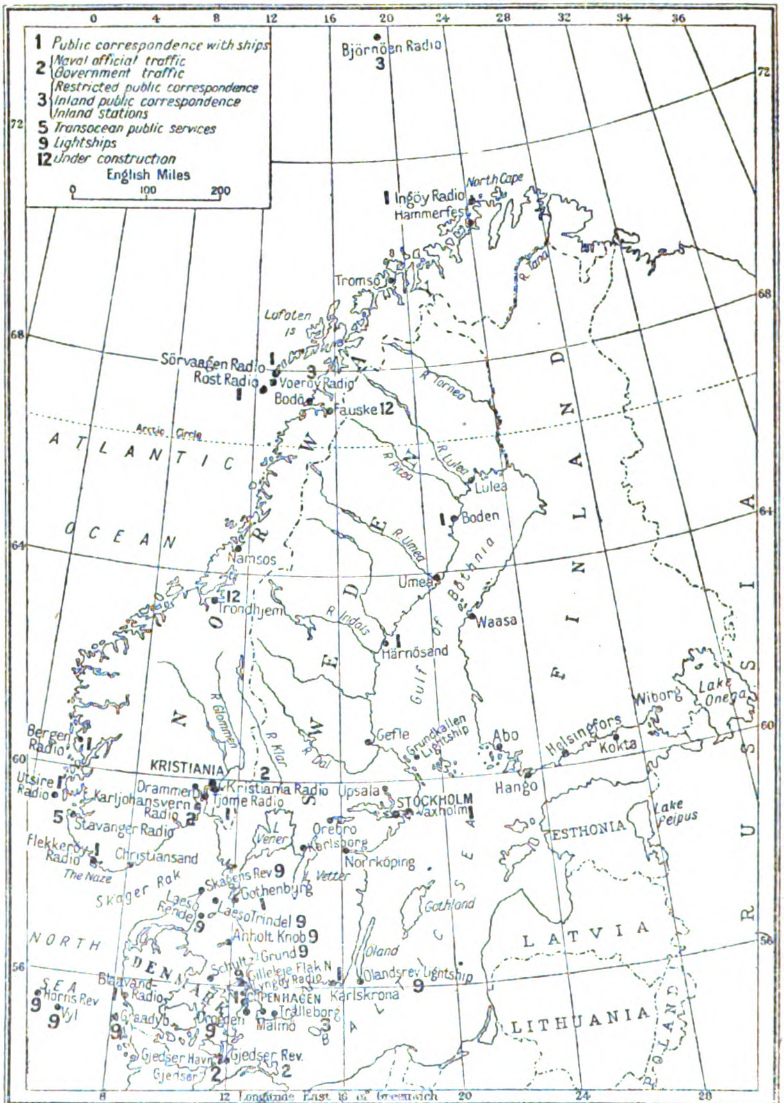
5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made by His Excellency the Governor this 10th day of November, 1916.

NORWAY

THE most westerly of the Scandinavian nations emerged from the obscurities of myth and legend in the ninth century, and, after a vigorous separate national existence, was united with Sweden and Denmark



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under Queen Margaret by the Union of Kalmar in 1397. In 1814 Norway separated from Denmark, and Charles XIII of Sweden established his rule over the two countries. This co-partnership endured until the peaceful revolution of 1905 restored to the Norwegians their complete independence.

Norway covers an area of 124,130 square miles, and is ruled by a King with the co-operation of the Norwegian Parliament, which bears the historic title of "Stor-thing." Its capital is Christiania, picturesquely situated on a fjord, which owes its patronymic to the city.

CONTROL.

Radiotelegraphy is organised under the supervision of the Telegraph Department; whilst for naval and military purposes the War Office and Admiralty exercise jurisdiction over their own wireless section.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Colonel T. Heftye..	Telegraph Department: Director-General of Telegraphs	Christiania
Mr. H. Petersen ..	Radio Engineer and Chief of Wireless Department	Christiania (Telegraph Department)
Capt. N. Nickelsen	Director of Mining Department of the Navy	Horten (Navy Yard)
Comdr. F. Bugge	Inspector Wireless Department of the Navy..	Horten (Navy Yard)

ORGANISATION.

The first wireless stations to be erected and opened for public correspondence were those at Sörvaagen and Röst, both completed in 1906. Radiotelegraphic communication was established in 1911 between Norway and Spitzbergen, and has been maintained ever since. The important Transatlantic long-distance station at Stavanger is now completed, whilst at Christiania another high-power installation has been erected for communication with the northern part of the country and abroad.

The latest available statistics enumerate :—

Stations for public service to ships	7
Stations for Government traffic only	1
Stations for public restricted service	3
Stations for Transatlantic public traffic	1
Stations under construction	3
Installations on Norwegian merchant vessels ..	about 500

Two Norwegian companies have been formed under the titles of "Norsk Marconi Kompani A/S" at Christiania, and A/S Det Norske Radioselskap. The former company is working in conjunction with Marconi's Wireless Telegraph Co., Ltd., London, and has the sole rights of the Marconi patents for Norway. The latter is working in conjunction with the Telefunken Company.

Meteorological, Storm Warning and Fisheries Services are largely in use, and there are three (two more will be added during the summer) D.F. stations in operation.

There are at present no wireless clubs or societies.

ADMINISTRATION.

The Laws and Regulations under which wireless is administered in this country appear in the following pages in accordance with the list appended hereto :—

A—Law of July 24th, 1914.
B—Law of August 18th, 1914.
C—Regulations.
D—Ship License.

E—Certificate for Wireless Telegraphists.
F—Notice to Mariners.
G—Agreement between Telegraph Administration of Norway, Denmark and Sweden regarding expeditious forwarding of radiotelegrams.

LAW OF JULY, 1914.

A Law of July 24th, 1914, supplementing and amending the Law of April 29th, 1899, relating to the forwarding of communications by aid of telegraphic conductors or such like installations and relating to the repeal of Law No. 2 of July 16th 1907:—

Section 1.—On ships which sail under the Norwegian flag and which do not belong to the Norwegian Navy, stations or installations for telegraphing or telephoning by wireless both within and without the boundaries of the Kingdom may only be installed and worked after an authorisation obtained in advance, which will be granted by the King, or whoever may be authorised thereto, on certain definite conditions for a stipulated period of time. The permission may at any time be withdrawn if the conditions imposed are not adhered to.

Detailed Rules and Regulations relating to the fitting up and working of such stations or installations shall be drawn up by the King.

On ships which sail under a foreign flag and are within Norwegian territorial waters wireless telegraphing and telephoning can only be carried on—even if they have permission for same from the authorities of the foreign country—subject to observance of the provisions which are made with respect thereto by the King or whomsoever he may have authorised for the purpose, who may, moreover, forbid all telegraphing or telephoning from such ships, whenever circumstances may be considered to require it.

Section 2.—The exceptions mentioned in the Law of April 29th, 1899, under Section 1, 2nd paragraph, relating to the working of plant which may be used by a commune or private person for his own use, or such as railways may instal for their own working, shall not apply so far as the working of installations for wireless telegraphy or telephony are concerned.

Section 3.—Any infractions of the aforementioned conditions shall be punished pursuant to the provisions laid down in the Law of April 29th, 1899, Section 6.

Moreover, any transgression of the rules or provisions which are drawn up with regard to Section 1 of the present Law shall be punished by fines.

Section 4.—This Law shall come into force immediately. The Law of July 16th, 1907, containing additions and amendments to the Law of April 29th, 1899, relating to the forwarding of communications by means of telegraph lines or similar installations, is hereby repealed.

LAW OF AUGUST, 1914.

B The following paragraph, taken from the "Law of August 18th, 1914," amending the Law of April 29th, 1899, relates directly to Wireless Telegraphy:—

Within the boundaries of Norway, or its territorial waters, stations and installations for wireless telegraphy and telephony may only be erected or worked after permission has been obtained from the King or whomsoever he may authorise thereto, and on such conditions as are laid down in the said permission.

REGULATIONS.

C The following regulations are based on the Law of July 24th, 1914:—

1. No radiotelegraphic station on board a foreign vessel within the limits of Norwegian territorial waters can be used without a special license.

Application for such license must be made to the Ministry of Telegraphs, which Ministry, after consultation with the Ministry of Marine, will decide on the application.

2. The license granting the right to use wireless telegraph stations within the radius of Norwegian territorial waters may be limited to definite places and to fixed hours of the day.

Wireless transmission of messages must be stopped immediately on the order of the Ministry of Telegraphs, Ministry of Marine, or of any coast station established by the aforesaid Ministries.

3. If the vessel is in a Norwegian port situated within a radius of 5 kilometres from the nearest telegraph station, the station on board the vessel cannot communicate either with Norwegian coast stations or with foreign coast stations.

Without a special license, a wireless station on board a vessel in a Norwegian port cannot be used for the exchange of messages with other ship stations unless for the purpose of advising accidents.

4. However, the preceding provisions do not apply to foreign ships of war, as far as the interchange of messages between themselves is concerned.

It is the duty, nevertheless, of stations on board foreign warships to conform to the provisions in Article 2, Paragraph 2, above.

5. If a station is used when a ship is in Norwegian territorial waters this station must conform to the provisions of the International Telegraphic Convention and the regulations appended thereto.

NORWEGIAN LICENSE CONDITIONS.

D *Conditions for erection and working of Radiotelegraph and Radiotelephone stations on board ships* (*ship stations*).

FORM OF LICENSE.

According to the Law of 24th July, 1914, and the Royal Decree of the 30th August, 1913, permission is hereby given to..........

....

to erect and work on board the ship..........
a Radiotelegraph Station (Radiotelephone Station) on accordance with the Table of Particulars on the last page of this form. The permission is valid from..................to
.... and is given on the following conditions.

1. The station shall belong to the..........
class of stations as specified in the International Radiotelegraph Convention Service Regulations, Art. XIII b, and will thus have........
................service.

2. The installation shall be effected in every

respect in accordance with the installation plan approved by the Telegraph Department, and must not be departed from without the agreement of the said department. Ships belonging to the 1st and 2nd classes must be provided with emergency Radiotelegraph installations, as laid down in the existing Radiotelegraphic Service Regulations.

3. The holder of the license shall, as far as the erection and working of the station is concerned, be under the obligation in every respect to adhere to existing international agreements with annexed regulations concerning Radiotelegraphy and Telephony when such International agreements have been adhered to by Norway, and further he shall abide by such regulations as may be issued by the Department for Public Works or by the Telegraph Department.

4. The Telegraph Department shall have the right, in the interests of the service and (after conferring with the Naval Department) to require any alterations to be made in the wavelengths employed as given in the above-mentioned Table of Particulars within the limits laid down in the regulations either as a temporary or permanent measure in the working of the station.

5. The holder of the license shall recognise the importance of keeping the station in the best possible condition in order to ensure good working.

6. The station shall be under the obligation to forward telegrams to and from persons on board, with due regard to existing general rules for such work. Further, the station shall be obliged to communicate with other ship or coast stations without regard to the system of apparatus employed at those stations.

7. The answering of signals from ships in distress and the correspondence caused thereby hall have priority over all other correspondence.

8. During the ship's stay in a Norwegian Port the station must not be used for communication either with Norwegian or with Foreign coast stations. Neither shall the station, while the ship is in a Norwegian port, be used for communication with other ship stations without special permission, or unless such communication is effected with a view to prevent accidents. Special permission is granted by the Telegraph Department after conferring with the Naval Department.

9. The call signal of the station is..........

10. The tax due to the ship station is............(ore) (.............. centimes) per word with a minimum of................(ore) (..............centimes) per message.

11. The service on board must be performed by one telegraphist, or, for ship stations of class I, by two or more telegraphists holding a certificate issued by the Telegraph Department.

This certificate states that the telegraphist concerned possesses the knowledge and abilities as prescribed in the existing International Regulations.

The granting of such certificate depends upon the passing of an examination arranged by the Telegraph Department. Petty Officers and Seamen belonging to the Navy's staff of mechanics, and who are specially trained as Radiotelegraphists for the Navy, are entitled to such certificate when they can prove to the Telegraph Department that they have the necessary knowledge of the handling of telegrams and when they procure from the authority concerned in the Navy, a testimonial to the effect that they satisfy the International Regulations as far as their knowledge of the instruments, ability, etc., is concerned. Without the permission of the Telegraph Department other than Norwegian subjects must not be employed for the service on board.

The holder of the license will take the best possible care that the contents of messages do not come to the knowledge of unauthorised persons.

The telegraphist will make the usual promise of secrecy.

12. The holder of the license is responsible for the charges that are due for the transmission of the messages sent from the ship station, including the charge for the coast station.

The Telegraph Administration, on its side, pays to the holder of the license the charges that are due to the ship station for the messages addressed to the ship. "Journals" (abstract) should be kept in respect of the correspondence (traffic). These "Journals," together with the originals of the transmitted messages and such other documents as may be required, are to be sent to the Telegraph Department, as far as possible, at the end of each month.

The mutual settlement of the charges will take place quarterly or monthly, as may be arranged between the Telegraph Department and the holder of the license. However, with the agreement of the Telegraph Department the holder of the license may make other arrangements for the accounting of stations on ships that are exclusively engaged in foreign waters. Such arrangements may be made with the Administrations to which the coast stations that the ships usually make use of belong. Similarly, the Telegraph Department may make arrangements other than those mentioned above with Foreign Administrations.

13. The station is subject to such supervision as may be decided by the Department for Public Works, and one or more of the Officials appointed by the Department for Public Works or by the Telegraph Department should be given opportunity to inspect the station.

For the supervision of the station the holder of the licence has to pay a certain fee that will be decided by the Department.

14. When State or other public reasons so demand it, the Department for Public Works or the Naval Department may partly or entirely prohibit the transmission of any kind of traffic correspondence at the station without admitting any claim for compensation. Likewise, in the interests of the service, the Telegraph or Naval Department can prohibit with the same effect all correspondence from the station, either at certain places or at certain times of the day.

15. The Norwegian State has the right to take over the station with six months' notice against compensation, the amount of which will be fixed after valuation, should it not be possible to arrive at an amicable adjustment.

The valuation will be made by a Committee of three members, whereof one member is nominated by the owner, one by the Telegraph Department and one by the Department for Public Works.

The member nominated by the Department for Public Works will be the Chairman of the Committee.

The questions put before the Committee will be decided solely by majority of votes.

In case the owner has not, within thirty days after the reception of the invitation, made

any such nomination as mentioned above, or in case the member nominated by him fails to attend, the valuation will then with obligatory effect be decided by the other nominees.

In case of equal voting the vote of the Chairman shall decide the matter.

In the valuation regard shall only be paid to the technical value of the station at the moment of valuation, the income, etc., derived from the station not being taken into account.

The valuation shall take place within a time-limit fixed by the Telegraph Department and will be at the public expense.

16. The license shall become null and void in case:—

(*a*) Use is not made of it within a year of its issue.

(*b*) Breach is made of any of its regulations.

(*c*) The ship ceases to fly the Norwegian flag.

17. Disputes as to the intent and meaning of this licence shall, with obligatory effect, be decided by the King.

The Telegraph Department,
Christiana..................19
....

SCHEDULE.

System	Type of Instalation.	Normal range (by day).	Wave-lengths (the normal wave to be underlined).	Description of Power Supply.	Description of Transmitting and Receiving Instruments. (Detailed sketch of connections attached.)	Type of Aerial (Sketch with measurements attached).	Description of Emergency Gear for ship stations of 1st and 2nd classes. (Detailed sketch of connections attached.)	Remarks

CERTIFICATE.

E

It is hereby testified, that........ ....has in a satisfactory manner stood the test for radiotelegraphists, ordered by the Telegraph Administration, comprising:—

(*a*) Management of apparatus, and knowledge of their action.

(*b*) Transmitting and receiving by the ear with the speed ordered for a certificate of............Class.

(*c*) Regulations.

With reference to above, and as............ has made the promise of secrecy fixed for telegraph officials, there is hereby given to........ ....a certificate of .... Class, as radiotelegraphist on board ships.

The Telegraph Administration, Kristiania, the......................

NOTICE TO MARINERS.

F

The State Telegraph Department issued in December, 1908, the following "Notice to Mariners" applying to wireless telegraph equipments on board ships in Norwegian territorial waters:—

1. Wireless telegraph or wireless telephone stations on board foreign vessels must not be operated, except by special permission, within Norwegian territorial waters. Requests for such permission must be sent to the Telegraph Department, which will communicate its decision after conference with the Marine Department.

2. Permission to operate the stations on board foreign vessels within Norwegian territorial boundaries may be restricted to certain fixed places, or to certain fixed periods of the 24 hours. Correspondence by means of the wireless apparatus shall be at once suspended whenever it shall be so desired by the Telegraph Department, the Marine Department, or by any one of the coast stations under their authority.

3. During the stay of a vessel in a Norwegian harbour, within a distance of 5 kilometres ($2\frac{7}{10}$ miles) from the nearest telegraph station, the station on board a foreign vessel must not be employed for telegraphing either with Norwegian or foreign coast stations. Without a special permission, the station during a vessel's stay in a Norwegian harbour must not be employed for communicating with other ship stations except for the purpose of preventing accidents.

4. The regulations above-mentioned do not, however, apply to stations on board vessels of war belonging to foreign powers, which carry on mutual correspondence. Such stations are, however, bound to submit themselves to the regulations contained in the second clause of Section 2.

5. Whenever the station on board a foreign vessel is employed during her stay in Norwegian territorial waters, this shall be done subject to the regulations contained in the International Telegraph Convention, with the rules pertaining thereto.

AGREEMENT

REGARDING CERTAIN EXCEPTIONS TO THE PROVISIONS OF ARTICLE XXXV OF THE SERVICE REGULATIONS ANNEXED TO THE INTERNATIONAL RADIOTELEGRAPH CONVENTION.

G

With a view to securing a more expeditious forwarding of radiotelegrams from a ship to its homeland, the following Agreement has been concluded between the Royal Norwegian, the Royal Danish, and the Royal Swedish Telegraph Administrations, subject to the necessary sanctions:—

Notwithstanding what is stipulated in Article XXXV para. 1 of the service regulations annexed to the International Radiotelegraph Convention, according to which a ship station shall as a rule send its radiotelegrams to the nearest coast station, radiotelegraph stations on board ship flying the Norwegian, Danish or Swedish flag are entitled to send to the nearest coast station of the ship's homeland such radio-

telegrams as are addressed to that country subject to the following conditions :—

1. That the ship is at least 25 nautical miles from any other coast station open for general correspondence.

2. That the ship's distance from the coast station concerned is not greater than the distance from any other coast station situated in a country other than Norway, Denmark or Sweden and open for general correspondence.

3. That transmissions cease immediately at the request of a nearer coast station whose correspondence is being disturbed by such transmissions, and

4. That the provisions of the International Radiotelegraph Convention and the annexed Service Regulations be maintained in other respects.

This Agreement which is executed in three copies and in each of three countries' languages comes into force on the 1st January, 1921, and shall remain in force indefinitely and until three months from the day on which it shall have been determined by one of the contracting parties.

Christiania, the..........December, 1920.
The Royal Norwegian Telegraph Administration.

Copenhagen, the........December, 1920.
The Royal Danish Telegraph Administration.

Stockholm, the..........December, 1920.
The Royal Swedish Telegraph Administration.

NYASALAND PROTECTORATE

(See map on p. 446.)

THIS Colony was constituted on May 14th, 1891, as the "British Central Africa" Protectorate, and so remained until 1907, when it assumed its present appellation. Its area covers 39,573 square miles, the trade centre being Port Herald, Chiromo (Lower-Shiré), Kota-Kota, Karonga, and Forts Johnston (Lake Nyasa). Communication is maintained by river steamer with the port of Chinde on the Indian Ocean littoral.

It is administered (under the Colonial Office) by the Governor and Commander-in-Chief, assisted by an Executive and an Administrative Council.

ADMINISTRATION.

Wireless Telegraphy is not at present in operation, although provision has been made in the Statute Book for its regulation if ever it be introduced, as follows :—

Wireless Ordinance, 1908.

1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1908."

2. No person shall establish or use any apparatus or installation for the purpose of operating wireless telegraphs without a license from the Governor.

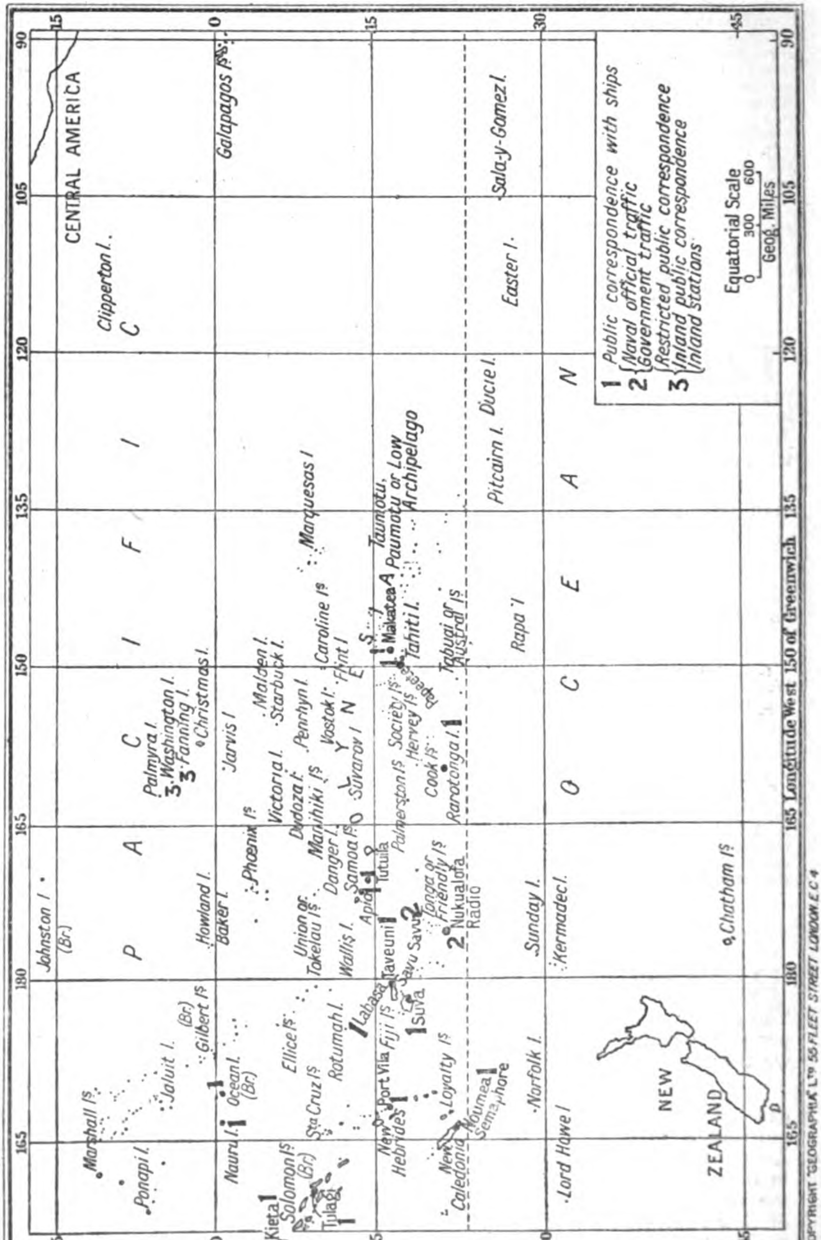
Any person contravening this section shall be liable on conviction to a fine not exceeding £100 or to imprisonment with or without hard labour for a term not exceeding twelve months with or without the option of a fine, and in addition any apparatus or installations in respect of which an offence under this section is committed may be forfeited and sold or disposed of as the Governor may direct.

3. The Governor in Council may from time to time make, and when made shall publish in the *Gazette*, rules prescribing the terms and conditions upon which licenses to establish or use apparatus or installations for the purpose of operating wireless telegraphs may be granted, and may impose a penalty on conviction for breach of any rules so made of a fine not exceeding £50 or imprisonment with or without hard labour for a term not exceeding six months with or without the option of a fine, and such Rules may further provide for forfeiture and sale or disposal as the Governor may direct of any such apparatus or installations as aforesaid.

PACIFIC ISLANDS

BEFORE the war, the islands in the Pacific were divided with regard to European supervision between Germany, France, and Great Britain. The former has now disappeared completely from the Pacific. It is not yet possible to include particulars concerning the French spheres of influence, and we therefore for the present confine ourselves to the British.

The High Commissioner of the Western Pacific (assisted by deputies) exercises jurisdiction in accordance with an Order in Council of 1893, for the purpose of carrying out the provisions of the Pacific Islanders' Protection Acts of 1872 and 1875, and to settle disputes between British subjects living in these islands. The authority of the High Commissioner extends over all the Western Pacific not within the limits of Fiji, New Zealand, Queensland, or New South Wales, or the jurisdiction of any civilised power, and includes the Southern Solomon Islands and the various small groups in Melanesia.


PACIFIC OCEAN
CENTRAL AMERICA
NEW ZEALAND
1 Public correspondence with ships
2 {Naval official traffic / Government traffic
3 {Restricted public correspondence / Inland public correspondence / Inland Stations
Equatorial Scale
0 300 600
Geog. Miles
165 Longitude West 150 of Greenwich 135
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Galapagos Is.
Clipperton I.
Easter I.
Sala-y-Gomez I.
Pitcairn I.
Ducie I.
Marquesas I.
Taumotu, Paumotu or Low Archipelago
Tahiti I.
Makatea
Rapa I.
Tubuai or Austral Is.
Caroline Is.
Malden I.
Starbuck I.
Christmas I.
Fanning I.
Washington I.
Palmyra I.
Jarvis I.
Penrhyn I.
Vostok I.
Flint I.
Society Is.
Hervey Is.
Cook Is.
Rarotonga I.
Palmerston Is.
Suvarov I.
Manihiki Is.
Danger I.
Victoria I.
Dudoza I.
Phoenix Is.
Samoa Is.
Apia
Tutuila
Union or Tokelau Is.
Wallis I.
Howland I.
Baker I.
Johnston I. (Br.)
Tonga or Friendly Is.
Nukualofa Radio
Taveuni
Savu Savu
Labasa
Suva
Fiji Is.
Sunday I.
Kermadec I.
Chatham Is.
Gilbert Is. (Br.)
Jaluit I.
Marshall Is.
Ponapi I.
Nauru I.
Ocean I. (Br.)
Ellice Is.
Rotumah I.
Sta Cruz Is.
Solomon Is. (Br.)
Kieta
Tulagi
New Hebrides
Port Vila
Loyalty Is.
New Caledonia
Noumea Semaphore
Norfolk I.
Lord Howe I.

The New Hebrides are ruled under the joint administration of British and French officials, in accordance with the Anglo-French Convention of 1906.

The principal groups consist of the British Solomon Islands, the Gilbert and Ellice Islands, the Tonga or Friendly Islands, the Phœnix Islands, Pitcairn Islands, and the New Hebrides.

Of these only Fanning Island (which under an Order in Council of January 27th, 1916, was included in the Gilbert and Ellice Colony) is connected by cable with the rest of the world.

With regard to the other islands, the only telegraphic communication is by means of wireless, and we are able to print below the Wireless Regulations in force in the Gilbert and Ellice Colony, wherein the centre of administration (at Ocean Island) is able to exchange official and public correspondence with Nauru, Tulagi and Apia. We also print regulations promulgated by the joint administration of the New Hebrides.

GILBERT AND ELLICE COLONY

THE Gilbert Islands were declared a British Protectorate on the 27th May, 1892, followed by the Ellice Islands in September of the same year, and named the "Gilbert and Ellice Islands Protectorate." The jurisdiction of the Resident Commissioner of the Protectorate was extended to the Ocean Island on the 28th November, 1900.

By the "Gilbert and Ellice Order in Council, 1915," the aforesaid Islands, together with all small islands, islets, rocks and reefs, depending on them, shall be annexed to and form part of His Majesty's Dominions, and shall be known as the "Gilbert and Ellice Islands Colony." The Administration of the Group is vested in a Resident Commissioner, who is responsible to The High Commissioner for the Western Pacific, with headquarters on Ocean Island.

The group comprises 31 islands, with a number of islets depending upon them, and lies between latitude 4° N. and 10° S.; its longitude being 169° E. to 158° W. The total area approximates to 200 square miles. Out of a population of about 32,000, four hundred are Europeans and three hundred and fifty Asiatics, the remainder being Polynesians and Micronesians.

CONTROL AND ORGANISATION.

Radiotelegraphy is a Government monopoly, though licenses may be granted for private erection and working. There are three wireless stations in the group, viz.: Ocean Island, Fanning, and Washington Islands. The two latter stations, which are privately owned by the Fanning and Washington Islands Trading Company, and licensed by this Colony, are not at present in operation.

Ocean Island is the only Government land station, being operated and controlled by the Government of the Colony. It comprises a Marconi standard 5 kw. set and modern amplifying valve receivers.

Both day and night communication was established with Suva, Fiji, in January, 1920, and an efficient service has been maintained since. In addition this station works with Tulagi and Nauru. 1,650 metre wave is used with all land stations, and 600 metres for ship working.

The times of working are as follows :—

Tulagi—Once daily, 9.15 a.m. until clear.
Nauru—9.45 a.m., 3.45 p.m. and 7.45 p.m. until clear.
Suva, Fiji—10.30 a.m. and 8 p.m. until clear.
Ships—9.30 a,m., 3.30 p.m. and 7.30 p.m.

Time—Standard of meridian 170° East.

There are no existing or projected stations designed for aviation or meteorological purposes and no time or weather programme is in force at any of the existing stations.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. G. L. G. Tilford	Officer in Charge	Ocean Island

ADMINISTRATION.

The following are the rules and regulations at present in force :—

A—King's Regulation No. IX of 1912.

B—Rules under the provisions thereof.

KING'S REGULATION No. IX OF 1912.

To Govern the Use of Wireless Telegraphy in the Western Pacific.

A 1. This Regulation may be cited as "The Wireless Telegraphy Regulation, 1912."

2. The Wireless Telegraphy Regulation, 1907, is hereby repealed.

3. (1) It shall not be lawful for any person to establish, instal or use any apparatus for the purpose of electrical communication by means of wireless telegraphy in any protectorates, islands, or places within the jurisdiction of the High Commissioner for the Western Pacific specified in the schedule hereto without a license to do so first obtained from the said High Commissioner.

(2) A license under this section shall be subject to such terms and conditions as may be prescribed by any rules made under this regulation and to such other terms and conditions as the High Commissioner may from time to time prescribe.

4. The High Commissioner may make rules from time to time to carry out the provisions of this regulation and in particular to regulate the use of apparatus for wireless telegraphy on board merchant ships, whether British or foreign vessels, while in the territorial waters of the protectorates or islands or places aforesaid.

5. Any person who contravenes the provisions of this Regulation or of any rules made hereunder, or fails to observe and perform the terms and conditions of a license granted by the High Commissioner hereunder or prescribed by any rules aforesaid, shall be liable to a penalty not exceeding one hundred pounds and to the forfeiture of any apparatus established, installed or used for the purpose aforementioned.

6. This Regulation shall not apply to the islands of the Pacific Ocean known as the New Hebrides, including the Banks Islands and Torres Islands.

SCHEDULE.

The British Solomon Islands Protectorate. The Gilbert and Ellice Islands Protectorate. The Union (Tokelau) Islands, The Phœnix Islands, Fanning Island, Washington Island, Christmas Island and all other islands in the Western Pacific not being within the jurisdiction of the Commonwealth of Australia or any of the states thereof or of the Dominion of New Zealand or of any civilised Power.

B Rules to Regulate the Use of Wireless Telegraph Apparatus on Merchant Ships in the Western Pacific, made by the High Commissioner under the Provisions of the Wireless Telegraphy Regulation, 1912.

1. These rules may be cited as the Wireless Telegraphy Rules, 1917.

2. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the protectorates, islands and places specified in the Schedule to the Wireless Telegraphy Regulation, 1912, shall be worked in such a way as not to interfere with—

(*a*) Naval signalling; and

(*b*) The working of any wireless telegraph station, lawfully established, installed or worked in those protectorates, islands or places or the territorial waters thereof;

and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

3. (*a*) The apparatus for wireless telegraphy on board a merchant ship shall not be worked whilst such ship is within a harbour in any colony, protectorate or island specified in the Schedule to the Wireless Telegraphy Regulation, 1912.

(*b*) For the proper enforcement of the above every ship of British register in any such harbour shall completely disconnect its aerial wires from its radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected.

(*c*) Every ship of foreign register in any such harbour shall, subject to the provisions of the following subsection (*d*) take down its aerial wires completely and disconnect the same from its radiotelegraph apparatus.

(*d*) A ship of foreign register remaining in any such harbour for less than twelve hours, may, at the discretion of the Resident Commissioner or other Government officer in charge of the colony, protectorate or island to which such harbour belongs, be permitted to leave its aerials up, provided the same are disconnected in accordance with the provisions of subsection (*b*) of this rule.

4. If at any time, in the opinion of the High Commissioner, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters aforesaid shall be subject to such further rules as may be made by the High Commissioner from time to time, and those rules may prohibit or regulate that use in all cases or in such cases as may be deemed desirable.

5. It shall be the duty of the master of a ship to see that the requirements of these rules are carried out.

6. These rules shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. The rules made on December 16th, 1912, are hereby repealed.

Dated this twenty-ninth day of August 1917.

NEW HEBRIDES

THE New Hebrides consist of four groups of islands, the Banks, Torres, Central, and Southern, lying between 12° and 20° south latitude and 165° and 170° east longitude. The four groups, which have an estimated area of 5,500 square miles, comprise some fifty to sixty islands, large and small, of which the largest are Santo (Espiritu Santo), Malekula, and Efate. The islands are administered by a Condominium established under a Convention between Great Britain and France, signed on October 20th, 1906, each country being represented by a Resident Commissioner. The seat of Government is at Vila, in the island of Efate. The laws of the two nations apply to their respective nationals in the group, as also such joint regulations as may be passed by the Resident Commissioners, or the High Commissioners for Great Britain and France under the authority of the Convention referred to. Natives are subject to regulations similarly enacted.

CONTROL AND ORGANISATION.

An agreement was arrived at in 1913 between the British and French Governments to establish a wireless telegraph station in the New Hebrides at the joint expense of the two Governments. In March, 1915, a contract was entered into with the Société Française Radio-électrique for the erection of such a station at Vila on the island of Efate. In October, 1915, the engineer and operator, together with the material, arrived at Vila, and on September 1st, 1916, the installation was completed, and the station opened to the public.

Wireless telegraphy in the New Hebrides is practically a State monopoly. No provision is made for licences for private installations, which are prohibited, except with the permission of the administration. The Resident Commissioners are responsible for the control of radiotelegraphic activity in the islands. The only station at present is the land station of Vila, which is directly controlled by Government and is open for public service to ships.

There are no firms or companies engaged in the manufacture of wireless apparatus, and no wireless societies or clubs. No aviation radio stations exist.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
The British and French	Resident Commissioners	Vila
Mr. J. Copie	Officer in Charge and Chief Operator	Vila
Mr. A. V. Middleton ..	Assistant Operator	Vila

ADMINISTRATION.

Two joint regulations affecting wireless telegraphy have been issued by the Condominium Administration, the first dated January 7th, 1909, No. 1, "The Wireless Telegraph Regulation, 1909," the other the "Wireless Telegraph (Ships) Regulation, No. 3, of 1916."

The texts of these appear below :—

A—Regulation dated 1909.

B—Wireless Telegraph (Ships) Regulation, 1916.

A JOINT REGULATION TO REGULATE THE INSTALLATION OF WIRELESS TELEGRAPHY IN THE NEW HEBRIDES.

A 1. From the date of the passing of this regulation it shall be unlawful for any person to use or establish in any of the islands of the New Hebrides, including the Banks and Torres Islands, any apparatus or installation for the purpose of electrical communication by wireless telegraphy without a license first obtained from the Resident Commissioners conjointly such license to be granted on such terms and conditions as the Resident Commissioners aforesaid may from time to time determine.

2. Any person offending against the provisions of the preceding section or failing to comply with the terms and conditions of a license when granted by the Resident Commissioners under the provisions of this regulation shall be liable to a penalty not exceeding twenty pounds and to forfeit any apparatus

used or established for the purpose aforementioned.

3. Offences against this regulation shall be justiciable by the Joint Court contemplated by the tenth Article of the Anglo-French Convention of the twentieth day of October, one thousand nine hundred and six, and pending the establishment of such court by the court of the nation to which or to whose legal system the accused may belong.

4. This regulation may be cited as "The Wireless Telegraphy Regulation, 1909."

Published and exhibited at the Public Offices of the Resident Commissioners for His Britannic Majesty and for the French Republic this seventh day of January in the year one thousand nine hundred and nine.

A Joint Regulation to Control the Use of Wireless Telegraph Apparatus on Merchant Vessels in the New Hebrides.

B 1. From the date of the passing of this regulation all apparatus for wireless telegraphy on board merchant ships in the territorial waters of the New Hebrides shall be worked in such a way as not to interfere with:

(*a*) Naval signalling;

(*b*) The working of any wireless telegraph station lawfully established, installed or worked in the New Hebrides or the territorial waters thereof; and

(*c*) The transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraph on board a merchant ship shall be worked or used while the ship is in any of the harbours of the New Hebrides except with the joint special or general permission of the Resident Commissioners.

3. The Resident Commissioners shall have power to issue such further rules as to them may seem expedient for the control of wireless telegraphy on merchant vessels and for the censorship of messages transmitted from such vessels while in the territorial waters of the Group.

4. Any infraction of this regulation shall be punishable by the Joint Court with a money penalty of from one to twenty pounds and imprisonment for one day to one month or with one or other of these penalties.

5. This regulation may be cited as the "Wireless Telegraph (Ships) Regulation, 1916."

Published and exhibited in the Public Offices of the Resident Commissioners for Great Britain and the French Republic, at Vila, in the New Hebrides, this 30th day of October, 1916.

TONGA ISLANDS

OTHERWISE known as the Friendly Islands, this group remained, until 1899, a neutral territory in accordance with the Declaration of Berlin, April 6th, 1886. Under the terms of the Anglo-German Agreement (November 14th, 1899), subsequently accepted by the United States, the Tonga Islands fell practically under the protectorate of Great Britain, which was proclaimed on May 19th, 1900. The present Sovereign is Queen Salote Tubou, born March 13th, 1900. The Legislative Assembly meets annually. It is composed of seven nobles, elected by their peers, seven elected representatives of the people and the seven Ministers of the Crown. Elections are held triennially.

Lack of means of rapid communication with the outside world has severely handicapped traders, growers and other residents of the Tongan group of islands.

Their long term of isolation is now ended, for direct wireless communication has been established between Nukualofa and Suva (Fiji Islands) and Apia (Samoan Islands).

The entire apparatus, which includes the latest magnifying valve receivers, power plant, storage batteries and specially designed masts, was manufactured by Amalgamated Wireless (Australasia), Ltd., at that company's works in Sydney, and erected by Australian engineers.

CONTROL.

A department of Telegraphs and Telephones was inaugurated at the time of the erection of the wireless station, under whose jurisdiction fall all matters concerning radiotelegraphy and telephony.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
Mr. J. R. Land	Officer in Charge of Telegraphs and Telephones ..	Nukualofa
(*Not yet appointed*)	Assistant Wireless Officer	Nukualofa

The station of Nukualofa is owned and controlled by the Tongan Government and handles commercial traffic.

ORGANISATION.

Nukualofa Radio (the only station yet erected in the Friendly Islands) was opened for commercial traffic on December 30th, 1919. The station works with Suva (Fiji), Apia (Samoa) and ships, as under, local time :—

9.50 a.m. clears with Suva on 600 metres ; 11.50 a.m. clears with Apia, using a transmitting wavelength of 1,200 metres (Apia transmits on 2,000 metres) ; 2.50 p.m. second clearance with Apia as above ; 2.20 p.m. second clearance with Suva on 600 metres ; 8 p.m. to 10 p.m., on watch, during which time clearances are again effected with Suva and Apia (both on 600 metres) and also with any ships within range and having traffic.

Telegrams are delivered between the hours of 9 a.m. and 4 p.m. No porterage charge is imposed on delivered telegrams. These are delivered within a one-mile radius of the wireless station. Telegrams for persons residing outside the mile radius are either posted to the addressee or delivered to an authorised agent residing within the mile radius.

No form of license is issued, there being at present no amateurs or experimenters in the Kingdom.

There are no time, press, aviation or direction finding services.

No regular system of broadcasting meteorological reports is in vogue, but when conditions demand it, weather reports are sent out for the information of all stations. All meteorological telegrams are handled free of charge.

ADMINISTRATION.

As regards the European population, Tonga comes under King's Regulation No. IX of 1912. (*See* Gilbert and Ellice Colony under " Pacific Islands.") The use of wireless stations on merchant ships is controlled by the " Wireless Telegraphy Rules, 1917," made under the above-mentioned King's Regulation. An Ordinance is in effect regulating the use of wireless by Tongan natives. (*See* A below.)

A—An Ordinance to govern the use of wireless telegraphy in the Kingdom of Tonga. (No. 5 of 1918.)

AN ORDINANCE

To Govern the Use of Wireless Telegraphy in the Kingdom of Tonga. (No. 5 of 1918.)

Be it enacted by the King by the advice and with the consent of the Privy Council as follows :—

1. The short title of this Ordinance shall be The Wireless Telegraphy Ordinance, 1918.

2. It shall not be lawful for any Tongan to establish maintain or use in the Kingdom of Tonga any apparatus or instrument for the purpose of electrical communication by means of wireless telegraphy without having previously obtained from the Privy Council a license in that behalf to be granted on such terms and conditions as may be prescribed by any rules made under this Ordinance and on such other terms and conditions as the Privy Council may from time to time think fit to prescribe.

3. It shall be lawful for His Majesty the King in Council from time to time to make rules :—

(*a*) Prescribing the manner in which licenses under this Ordinance are to be applied for and granted and the fees payable on the grant of such license.

(*b*) Generally for the purpose of carrying this Ordinance into effect.

4. Any person who contravenes the provisions of this Ordinance or of any rules made hereunder or fails to observe or perform the terms or conditions of a license granted hereunder or prescribed by any rules aforesaid shall be liable on conviction to a fine not exceeding fifty pounds or in default of payment to imprisonment for any term not exceeding six months and the apparatus or instrument in respect of which such conviction was obtained may by order of the magistrate before whom such conviction was obtained be forfeited.

5. All proceedings under this Ordinance may be taken before a Police Magistrate and the mode of procedure shall be according to the law in force for the time being in respect of other offences punishable on conviction before a Police Magistrate.

March 5th, 1918.

PANAMA (CANAL ZONE)

THE idea of a Canal through the Isthmus of Panama originated with a Spanish engineer in 1530. Monsieur de Lesseps laboured on its construction from 1882 to 1894, when the United States Government took

over the undertaking. This action of the U.S.A. followed closely on the establishment of a separate Republic of Panama (a secession from the U.S. of Colombia), which took place on November 3rd, 1903. The American Canal was opened for traffic on August 15th, 1914.

The American-controlled zone consists of a strip of land 10 miles in width, extending across the Isthmus a distance of 50 miles. The rights of sovereignty are vested in the U.S.A. under a Treaty signed on February 26th, 1904.

The zone is ruled by a Governor, who reports through the Secretary of War to the President and conducts the government according to the authority invested in him by Acts of Congress and Executive orders. In periods of crisis or times of war the supreme command is vested in the Commanding Officer of the Troops, designated as the Panama Canal Department of the U.S.A. Army.

CONTROL.

Radiotelegraphy in the zone is administered by the Navy Department of the United States. All wireless stations on the Isthmus are under control of the Commandant, 15th Naval District, Balboa Heights, Canal Zone, and under the immediate supervision of the Communication Superintendent, 15th Naval District.

Under agreement between the Republic of Panama and the United States of America Radiotelegraphic Communication within the Republic, as well as in the Canal Zone, remains under the control of the U.S.A. This arrangement rests on Decree No. 130 of August 29th, 1914, signed by the President of the Panama Republic.



OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Capt. L. R. Sargent, U.S.N.	Marine Superintendent Panama Canal and Commandant 15th U.S. Naval District	Balboa Heights
Lt.-Com. F. L. Riefkohl ..	Communication Superintendent 15th U.S. Naval District	Balboa Radio Station Fort Amador

ORGANISATION.

The first radio station erected was situated in the Republic of Panama within the municipal limits of the City of Colon, in 1906, and the reservation there established is still the site of a successor to this pioneer station.

The small station established at Porto Bello, Panama, in 1909, was closed on May 13th, 1914. The Colon station, established on March 1st, 1910, was re-equipped with improved apparatus, and opened to commercial traffic in January, 1913. At Balboa (Pacific end of the Canal) there stands a station opened for commercial business in June, 1913, and replaced by an improved installation on the same site in 1914. The well-known "Darien" station (located alongside the Canal, midway between the oceans) is a high-power installation, designed primarily for communication with Washington and for naval vessels at sea. It possesses a sending radius of 3,000 miles, and was placed in regular service on April 5th, 1915.

There is a Naval Radio Station for communication with aircraft at the Naval Air Station, Coco Solo, C.Z. It is contemplated to instal a radio telephone transmitter at that station some time in the near future, which will be available for use in handling commercial traffic. No definite information is available as to the time when this set will be installed.

There have been some developments not shown above, but no information concerning them has yet been disclosed.

There are no wireless clubs or radio societies, the whole of the wireless operations being controlled and administered by the U.S. Navy.

An unofficial news service for the benefit of persons at sea is carried on by the Colon station, which each day at 3.30 p.m. radiates broadcast about 200 words of news made up of extracts from the Panama morning papers, whilst Press despatches obtained by radio from the United States are re-broadcasted at 5 a.m. by Balboa (NBA) on 7,000 metres (arc) and 2,400 metres spark.

ADMINISTRATION.

We publish below the text of the various Acts and Decrees affecting radiotelegraphy in the Canal Zone in accordance with the following list:—

A—Act to regulate Radio Communication issued August 13th, 1912.
B—Section 6 of Act to Provide for Opening, Maintenance, Protection and Operation of the Panama Canal (dated August 24th, 1912).
C—Extracts from Rules and Regulations for the Operation and Navigation of the Panama Canal, dated August 15th, 1919.
D—Notice concerning Commercial Service at Naval Stations, dated September 1st, 1913.
E—Circular *re* Compulsory Wireless, dated July 23rd, 1914.
F—Circular *re* Free Radio Service, dated November 17th, 1914.

AN ACT TO REGULATE RADIO COMMUNICATION.

A Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a person, company, or corporation within the jurisdiction of the United States shall not use or operate any apparatus for radio communication as a means of commercial intercourse among the several States, or with foreign nations, or upon any vessel of the United States engaged in interstate or foreign commerce, or for the transmission of radiograms or signals the effect of which extends beyond the jurisdiction of the State or Territory in which the same are made, or where interference would be caused thereby with the receipt of messages or signals from beyond the jurisdiction of the said State or Territory, except under and in accordance

with a license, revocable for cause, in that behalf granted by the Secretary of Commerce and Labour upon application therefor; but nothing in this Act shall be construed to apply to the transmission and exchange of radiograms or signals between points situated in the same State: Provided, that the effect thereof shall not extend beyond the jurisdiction of the said State or interfere with the reception of radiograms or signals from beyond said jurisdiction; and a license shall not be required for the transmission or exchange of radiograms or signals by or on behalf of the Government of the United States, but every Government station on land or sea shall have special call letters designated and published in the list of radio stations of the United States by the Department of Commerce and Labour. Any person, company, or corporation that shall use or operate any apparatus for radio communication in violation of this section, or knowingly aid or abet another person, company, or corporation in so doing, shall be deemed guilty of a misdemeanour, and on conviction thereof shall be punished by a fine not exceeding five hundred dollars, and the apparatus or device so unlawfully used and operated may be adjudged forfeited to the United States.

SEC. 2.—That every such license shall be in such form as the Secretary of Commerce and Labour shall determine and shall contain the restrictions, pursuant to this Act, on and subject to which the license is granted; that every such license shall be issued only to citizens of the United States or Porto Rico or to a company incorporated under the laws of some State or Territory or of the United States or Porto Rico, and shall specify the ownership and location of the station in which said apparatus shall be used and other particulars for its identification and to enable its range to be estimated; shall state the purpose of the station, and, in case of a station in actual operation at the date of passage of this Act, shall contain the statement that satisfactory proof has been furnished that it was actually operating on the above-mentioned date; shall state the wavelength or the wavelengths authorised for use by the station for the prevention of interference and the hours for which the station is licensed for work; and shall not be construed to authorise the use of any apparatus for radio communication in any other station than that specified. Every such license shall be subject to the regulations contained herein, and such regu-ations as may be established from time to time by authority of this Act or subsequent Acts and treaties of the United States. Every such licence shall provide that the President of the United States in time of war or public peril or disaster may cause the closing of any station for radio communication and the removal therefrom of all radio apparatus, or may authorise the use or control of any such station or apparatus by any department of the Government, upon just compensation to the owners.

SEC. 3.—That every such apparatus shall at all times while in use and operation as aforesaid be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce and Labour. Every person so licensed who in the operation of any radio apparatus shall fail to observe and obey regulations contained in or made pursuant to this Act or subsequent Acts or treaties of the United States, or any one of them, or who shall fail to enforce obedience thereto by an unlicensed person while serving under his supervision, in addition to the punishments and penalties herein prescribed, may suffer the suspension of the said license for a period to be fixed by the Secretary of Commerce and Labour not exceeding one year. It shall be unlawful to employ any unlicensed person or for any unlicensed person to serve in charge or in supervision of the use and operation of such apparatus, and any person violating this provision shall be guilty of a misdemeanour, and on conviction thereof shall be punished by a fine of not more than one hundred dollars or imprisonment for not more than two months, or both, in the discretion of the court, for each and every such offence: Provided, that in case of emergency the Secretary of Commerce and Labour may authorise a collector of customs to issue a temporary permit, in lieu of a license, to the operator on a vessel subject to the radio ship Act of June twenty-fourth, nineteen hundred and ten.

SEC. 4.—That for the purpose of preventing or minimising interference with communication between stations in which such apparatus is operated, to facilitate radio communication, and to further the prompt receipt of distress signals, said private and commercial stations shall be subject to the regulations of this section. These regulations shall be enforced by the Secretary of Commerce and Labour through the collectors of customs and other officers of the Government as other regulations herein provided for.

The Secretary of Commerce and Labour may, in his discretion, waive the provisions of any or all of these regulations when no interference of the character above mentioned can ensue.

The Secretary of Commerce and Labour may grant special temporary licenses to stations actually engaged in conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours and under such conditions as will insure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations.

In these regulations the naval and military stations shall be understood to be stations on land.

REGULATIONS.

1. *Normal Wavelength.*—Every station shall be required to designate a certain definite wavelength as the normal sending and receiving wavelength of the station. This wavelength shall not exceed 600 metres or it shall exceed 1,600 metres. Every coastal station open to general public service shall at all times be ready to receive messages of such wavelengths as are required by the Berlin Convention. Every ship station, except as hereinafter provided, and every coast station open to general public service shall be prepared to use two sending wavelengths, one of 300 metres and one of 600 metres, as required by the international convention in force: Provided, that the Secretary of Commerce and Labour may, in his discretion, change the limit of wavelength reservation made by Regulations 1 and 2 to accord with any international agreement to which the United States is a party.

2. *Other Wavelengths.*—In addition to the normal sending wavelength all stations, except as provided hereinafter in these regu-ations, may use other sending wavelengths: Provided, that they do not exceed 600 metres

or that they do exceed 1,600 metres: Provided further, that the character of the waves emitted conforms to the requirements of Regulations 3 and 4 following.

3. *Use of a "Pure Wave."*—At all stations if the sending apparatus, to be referred to hereinafter as the "transmitter," is of such a character that the energy is radiated in two or more wavelengths, more or less sharply defined, as indicated by a sensitive wavemetre, the energy in no one of the lesser waves shall exceed 10 per cent. of that in the greatest.

4. *Use of a "Sharp Wave."*—At all stations the logarithmic decrement per complete oscillation in the wave trains emitted by the transmitter shall not exceed two-tenths, except when sending distress signals or signals and messages relating thereto.

5. *Use of "Standard Distress Wave."*—Every station on shipboard shall be prepared to send distress calls on the normal wavelength designated by the international convention in force except on vessels of small tonnage unable to have plants insuring that wavelength.

6. *Signal of Distress.*—The distress call used shall be the international signal of distress:—

• • • ▬ ▬ ▬ • • •

7. *Use of "Broad Interfering Wave" for Distress Signals.*—When sending distress signals, the transmitter of a station on shipboard may be tuned in such a manner as to create a maximum of interference with a maximum of radiation.

8. *Distance Requirement for Distress Signals*—Every station on shipboard, wherever practicable, shall be prepared to send distress signals of the character specified in Regulations 5 and 6 with sufficient power to enable them to be received by day over sea a distance of 100 nautical miles by a shipboard station equipped with apparatus for both sending and receiving equal in all essential particulars to that of the station first mentioned.

9. *"Right of Way" for Distress Signals.*—All stations are required to give absolute priority to signals and radiograms relating to ships in distress; to cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, to refrain from sending until all signals and radiograms relating thereto are completed.

10. *Reduced Power for Ships near a Government Station.*—No station on shipboard, when within fifteen nautical miles of a naval or military station, shall use a transformer input exceeding one kilowatt, nor, when within five nautical miles of such a station, a transformer input exceeding one-half kilowatt, except for sending signals of distress or signals or radiograms relating thereto.

11. *Intercommunication.*—Each shore station open to general public service between the coast and vessels at sea shall be bound to exchange radiograms with any similar shore station and with any ship station without distinction of the radio systems adopted by such stations, respectively, and each station on shipboard shall be bound to exchange radiograms with any other station on shipboard without distinction of the radio systems adopted by each station, respectively.

It shall be the duty of each such shore station during the hours it is in operation, to listen in at intervals of not less than fifteen minutes and for a period of not less than two minutes, with the receiver tuned to receive messages of 300 metre wavelengths.

12. *Division of Time.* — At important seaports and at all other places where naval or military and private or commercial shore stations operate in such close proximity thae interference with the work of naval and military stations cannot be avoided by the enforcement of the regulations contained in the foregoing regulations concerning wavelengths and the character of signals emitted, such private or commercial shore stations as do interfere with the reception of signals by the naval and military stations concerned shall not use their transmitters during the first fifteen minutes of each hour, local standard time. The Secretary of Commerce and Labour may, on the recommendation of the Department concerned, designate the station or stations which may be required to observe this division of time.

13. *Government Stations to Observe Division of Time.*—The naval or military stations for which the above-mentioned division of time may be established shall transmit signals or radiograms only during the first fifteen minutes of each hour, local standard time, except in case of signals or radiograms relating to vessels in distress, as hereinbefore provided.

14. *Use of Unneccessary Power.*—In all circumstances, except in case of signals or radiograms relating to vessels in distress, all stations shall use the minimum amount of energy necessary to carry out any communication desired.

15. *General Restrictions on Private Stations.*—No private or commercial station not engaged in the transaction of *bona fide* commercial business by radio communication or in experimentation in connection with the development and manufacture of radio apparatus for commercial purposes shall use a transmitting wavelength exceeding 200 metres, or a transformer input exceeding one kilowatt, except by special authority of the Secretary of Commerce and Labour contained in the licence of the station: *Provided*, That the owner or operator of a station of the character mentioned in this regulation shall not be liable for a violation of the requirements of the third or fourth regulations to the penalties of $100 or $25, respectively provided in this section unless the person maintaining or operating such station shall have been notified in writing that the said transmitter has been found, upon tests conducted by the Government, to be so adjusted as to violate the said third and fourth regulations, and opportunity has been given to said owner or operator to adjust said transmitter in conformity with said regulations.

16. *Special Restrictions in the Vicinities of Government Stations.*—No station of the character mentioned in regulation 15 situated within five nautical miles of a naval or military station shall use a transmitting wavelength exceeding 200 metres or a transformer input exceeding one-half kilowatt.

17. *Ship Stations to Communicate with Nearest Shore Station.*—In general, the shipboard stations shall transmit their radiograms to the nearest shore station. A sender on board a vessel shall, however, have the right to designate the shore station through which he desires to have his radiograms transmitted. If this cannot be done, the wishes of the sender are to be complied with only if the transmission can be effected without interfering with the service of other stations.

18. ***Limitations for Future Installations in Vicinities of Government Stations.***—No station on shore not in actual operation at the date of the passage of this Act shall be licensed for the transaction of commercial business by radio communication within fifteen nautical miles of the following naval or military stations—to wit: Arlington, Virginia; Key West, Florida; San Juan, Porto Rico; North Head and Tatoosh Island, Washington; San Diego, California; and those established or which may be established in Alaska and in the Canal Zone; and the head of the department having control of such Government stations shall, so far as is consistent with the transaction of governmental business, arrange for the transmission and receipt of commercial radiograms under the provisions of the Berlin convention of 1906 and future international conventions or treaties to which the United States may be a party, at each of the stations above referred to and shall fix the rates therefor, subject to control of such rates by Congress. At such stations and wherever and whenever shore stations open for general public business between the coast and vessels at sea under the provisions of the Berlin convention of 1906 and future international conventions and treaties to which the United States may be a party shall not be so established as to insure a constant service day and night without interruption, and in all localities wherever or whenever such service shall not be maintained by a commercial shore station within 100 nautical miles of a naval radio station, the Secretary of the Navy shall, so far as is consistent with the transaction of governmental business, open naval radio stations to the general public business described above, and shall fix rates for such service, subject to control of such rates by Congress. The receipts from such radiograms shall be covered into the Treasury as miscellaneous receipts.

19. *Secrecy of Messages.*—No person or persons engaged in or having knowledge of the operation of any station or stations shall divulge or publish the contents of any messages transmitted or received by such station, except to the person or persons to whom the same may be directed, or their authorised agent, or to another station employed to forward such message to its destination, unless legally required so to do by the court of competent jurisdiction or other competent authority. Any person guilty of divulging or publishing any message, except as herein provided, shall, on conviction thereof, be punishable by a fine of not more than $250 or imprisonment for a period of not exceeding three months, or both fine and imprisonment, in the discretion of the Court.

Penalties.—For violation of any of these regulations, subject to which a license under sections 1 and 2 of this Act may be issued, the owners of the apparatus shall be liable to a penalty of $100, which may be reduced or remitted by the Secretary of Commerce and Labour, and for repeated violations of any of such regulations the licence may be revoked.

For violation of any of these regulations, except as provided in Regulation 19, subject to which a license under section 3 of this Act may be issued, the operator shall be subject to a penalty of $25, which may be reduced or remitted by the Secretary of Commerce and Labour, and for repeated violations of any such regulations, the licence shall be suspended or revoked.

Sec. 5.—That every license granted under the provisions of this Act for the operation or use of apparatus for radio communication shall prescribe that the operator thereof shall not wilfully or maliciously interfere with any other radio communication. Such interference shall be deemed a misdemeanour, and upon conviction thereof the owner or operator, or both, shall be punishable by a fine of not to exceed $500 or imprisonment for not to exceed one year, or both.

Sec. 6.—That the expression "radio communication" as used in this Act means any system of electrical communication by telegraphy or telephony without the aid of any wire connecting the points from and at which the radiograms, signals, or other communications are sent or received.

Sec. 7.—That a person, company, or corporation within the jurisdiction of the United States shall not knowingly utter or transmit or cause to be uttered or transmitted, any false or fraudulent distress signal or call or false or fraudulent signal, call, or other radiogram of any kind. The penalty for so uttering or transmitting a false or fraudulent distress signal or call shall be a fine of not more than $2,500 or imprisonment for not more than five years, or both, in the discretion of the court, for each and every such offence, and the penalty for so uttering or transmitting, or causing to be uttered or transmitted, any other false or fraudulent signal, call, or other radiogram shall be a fine of not more than $1,000 or imprisonment for not more than two years, or both, in the discretion of the court, for each and every such offence.

Sec. 8.—That a person, company, or corporation shall not use or operate any apparatus for radio communication on a foreign ship in territorial waters of the United States otherwise than in accordance with the provisions of sections 4 and 7 of this Act and so much of section 5 as imposes a penalty for interference. Save as aforesaid, nothing in this act shall apply to apparatus for radio communication on any foreign ship.

Sec. 9.—That the trial of any offence under this Act shall be in the district in which it is committed, or if the offence is committed upon the high seas or out of the jurisdiction of any particular State or district the trial shall be in the district where the offender may be found or into which he shall be first brought.

Sec. 10.—That this Act shall not apply to the Philippine Islands.

Sec. 11.—That this Act shall take effect and be in force on and after four months from its passage.

Approved, August 13th, 1912.

EXTRACT FROM ACT.

(Dated August 24th, 1912.)

To Provide for Opening, Maintenance, Protection and Operation of the Panama Canal.

B Sec. 6.—That the President is authorised to cause to be erected, maintained, and operated, subject to the International Convention and the Act of Congress to regulate radio communication, at suitable places along the Panama Canal and the coast adjacent to its two terminals, in connection with the operation of the said Canal, such wireless telegraphic installations as he may deem necessary for the operation, maintenance, sanitation, and protection of said Canal, and for other purposes. If it is found necessary

to locate such installations upon territory of the Republic of Panama, the President is authorised to make such agreement with said Government as may be necessary, and also to provide for the acceptance and transmission by said system, of all private and commercial messages, and those of the Government of Panama, on such terms and for such tolls as the President may prescribe: *Provided*, That the messages of the Government of the United States and the departments thereof, and the management of the Panama Canal, shall always be given precedence over all other messages. The President is also authorised, in his discretion, to enter into such operating agreements or leases with any private wireless company or companies as may best insure freedom from interference with the wireless telegraphic installations established by the United States.

EXTRACT FROM RULES AND REGULATIONS.

(Dated August 15th, 1919.)

C 40. *Radio Communication.* — As soon as radio communication can be established with the Canal, vessels should report their names, nationality, length, draft, tonnage, whether or not they desire to pass through the Canal, require coal, provisions, supplies, repairs, to go alongside of a wharf, the use of tugs, probable time of arrival, length of stay in port, or any other matters of importance or interest. If this information has been previously communicated through agents or otherwise to the captain of the port, it will not be necessary to report by radio; but the probable time of arrival should always be sent.

41. Control of radio communication is entirely in the hands of the radio shore stations. No vessel will be allowed to interfere in the slightest degree with the Canal radio stations; upon an order being received by a vessel at any time while within the waters under the control of the Canal to discontinue using radio, even if in the midst of transmission of a message, she shall immediately comply.

42. Upon a ship's arriving within the 15-mile limit, and until leaving the 15-mile limit of the Canal Zone, she shall transmit only with low power, not exceeding one-half kilowatt.

43. Messages to stations will be sent only to Colon station (NAX) when in Gatun Locks and to northward thereof, and only to Balboa station (NBA) when in Miraflores Locks and to southward thereof; between these two points ships may work to either station, preferably to the nearer one; the high-power station (Darien) at Radio will not handle commercial work and will not be called for Canal business except in case of emergency.

44. All messages between ships in the Canal Zone and ships at sea must be forwarded through the nearer shore station.

45. Messages from ships in the Caribbean Sea for ships in the Pacific waters, or *vice versa*, shall be routed through the Canal Zone shore stations.

46. All vessels fitted with radio, after leaving the terminal harbour to pass through the Canal, shall keep an operator on watch until the further terminal harbour has been reached; this applies to the time when they are anchored in Gatun Lake, while passing through the locks, or moored to the lock walls, or to any of the wharves in the Canal proper as well as when they are under way. Messages relating to the ship's movements and the Canal business shall take precedence over all commercial messages.

47. Pilots on vessels passing through the Canal shall have the right to use a vessel's radio freely for the transaction of the Canal business.

48. Under the direction of the pilots, vessels will from time to time report their progress through the Canal; accidents to machinery, propellers, steering gear, equipment, or anything else that may delay them or require assistance; any sickness or casualties that require medical attendance from Canal officials; or any other matters of importance that may arise.

49. No radio tolls, either coast station or forwarding, will be imposed against ships on radiograms transmitted by ships on Canal business. There will be no charge made against the Panama Canal, by Canal Zone land lines or radio stations, for the transmission of radiograms to ships on Canal business.*

50. No vessel will be allowed to communicate with any lock or signal station while in transit through the Canal, except through the pilot; all messages of any kind must be sent through him. This does not apply to vessels moored at the terminals at Cristobal or Balboa, before entering or after having passed through the Canal, which may wish to communicate through the terminal stations.

51. Vessels in transit through the Canal can communicate with the lock and signal station through the pilots, both by the international code and special signals; information on this subject may be obtained from the Governor of the Panama Canal.

118. In thick and foggy weather vessels will not be allowed to enter the Canal or leave locks or mooring station until the weather has cleared. Vessels in transit, when overtaken by thick or foggy weather, must immediately take every precaution and make preparation to anchor or moor at the first available place, and so remain until the weather clears. Vessels equipped with radio, when overtaken by thick or foggy weather, should immediately so report, in order that the proper fog signals may be made at the mooring stations on the approach of such vessels.

RADIO SERVICE.

Control of Radio.—The United States Government controls radio in the Republic of Panama and contiguous waters. The U.S. Naval Communication Service maintains three Naval Radio Stations in the Canal Zone; coastal stations at Colon and Balboa, and a high-powered station at Darien. In the Republic of Panama it maintains Naval Radio Stations at Cape Mala, La Palma, and Puerto Obaldia. The Cape Mala Radio Station, located at Cape Mala, R. P., at the south-west entrance to the Bay of Panama, is connected by telegraph with the Canal Zone and all telegraph offices in the Republic of Panama. The Radio Stations at La Palma and Puerto Obaldia are located in outlying sections of the Republic of Panama which have no telegraph connections, and are primarily for intercommunication between these districts and other sections of the Republic of Panama and the Canal Zone, through Balboa Radio. Control of radio communication is entirely in the hands of these stations. No vessel will be allowed to interfere in the slightest degree with the Canal radio stations; upon an

* As Amended by Executive Order of November 4th, 1914.

order being received by a vessel at any time while within the waters under the control of the Canal to discontinue using radio, even if in the midst of transmission of a message, she shall immediately comply.

Commercial Radiograms.—All Naval Radio stations given above, except Darien, are open to commercial traffic.

Canal Business Radiograms.—With the exception of Darien, all Naval Radio Stations given above will handle Canal business addressed to the proper officials of the Panama Canal, its departments and subsidiary companies. No receiving or forwarding charge will be made by the Naval Radio Stations for this service. The first word in the address of such messages should be "GOVT" (Example: "GOVT Port Captain Cristobal,") to show that they are official messages on Canal business. The shore stations reserve the right to decide whether a message is official or commercial in character.

Stations to be Called.—Ships on the Atlantic side will communicate only with Colon (NAX). Ships on the Pacific within 50 miles of Balboa will communicate only with Balboa (NBA). Ships in the Pacific when more than 50 miles from Balboa will communicate with Cape Mala (NNT), from which station messages are relayed to the Canal Zone or Republic of Panama by telegraph. Ships in the Canal, when to the Northward of Darien will work Colon (NAX), when to the Southward of Darien work Balboa (NBA).

Ships will communicate through nearest shore station. On arriving within range of a shore station ships should send a (TR) position report, furnishing data required by Article 28, Service Regulations Affixed to the International Radiotelegraphic Convention, London, 1912. Due to the large amount of radio work in the vicinity of the Canal, and the necessity of reducing interference to a minimum, ships should send the required position report whether they have messages to transmit or not. This is desired in order that the calling of vessels by shore stations having messages for such ships may be reduced to a minimum. Upon receiving a position report from a ship, the shore station will know that the ship is in range and will immediately deliver any messages on file for that ship. Any ship which desires to communicate with a shore station, and has not previously submitted a (TR) report to that station, will be requested to submit such report before any messages are accepted from it.

All TR reports received are given to the Port Captain concerned and to the vessel's agents (if known).

Balboa Radio (NBA) is a distant control (Receiving) station, therefore, in case of emergency, Balboa Radio may be called and communication with it established, though Balboa may at the time be transmitting.

Hours of Service.—Colon, Balboa, and Cape Mala maintain a constant watch, day and night.

La Palma and Puerto Obaldia maintain daily schedules of watches.

EXTRACT FROM SUPPLEMENT TO RULES.

(Dated September 1st, 1913.)

COMMERCIAL SERVICE AT NAVAL RADIO STATIONS.

Beginning September 1st, 1913, the radio stations of the United States Navy at Colon and Balboa are handling special classes of commercial radiograms, heretofore prohibited, as follows:—

1. Reply paid messages (where both message and answer can be prepaid by the sender).

2. Messages calling for repetition of messages (for verification only). Charge for repeating back is one-fourth the charge for the original message.

3. Radiograms to be delivered by mail. (If received from a ship, these will be mailed from the radio station. "Ocean letters" will be mailed by the ship at the first port of call, or at any port of call designated).

4. Multiple radiograms. These are messages addressed either to several persons at same address or to same person at several addresses served by the same radio station. These messages when received from sea will be separated and sent as so many individual messages over the land wire.

5. Radiograms calling for acknowledgment of receipt. (Such acknowledgment is restricted to notification of date and hour at which the coast station delivered the radiogram to ship addressed; and may be sent by either mail or telegram).

6. Paid service notices. (Sent in order to correct address or text to cancel a message, etc.)

Both stations, Colon and Balboa, are connected by direct wire with the Panama railroad telephone system and radiograms can be filed at any local office. Attention is invited to the fact that no collect messages are handled, and no commercial messages are handled, between stations which are connected by cable or telegraph, as, for instance, to Key West or Port Lincoln.

The time of arrival of all Panama railroad boats is given to the telephone control at Colon as soon as received, and can be obtained there upon request without calling the radio station at Colon.

EXECUTIVE ORDER.

WIRELESS APPARATUS ON OCEAN-GOING VESSELS.

Published in Circular No. 601-16, dated Culebra, C.Z., July 23rd, 1914.

To Require Ocean-going Vessels to be Fitted with Wireless Apparatus.

By virtue of the authority vested in me, I hereby establish the following order for the Canal Zone:—

SEC. 1.—From and after the first day of July, 1915, it shall be unlawful for any ocean-going steamer of the United States, or of any foreign country, carrying fifty or more persons including passengers and crew, to leave or attempt to leave any port of the Canal Zone unless such steamer shall be equipped with an efficient apparatus for radio communication in good working order in charge of a person skilled in the use of such apparatus, which apparatus shall be capable of transmitting and receiving messages for a distance of at least 100 miles, night or day: *Provided*, That the provisions of this order, shall not apply to steamers plying only between the Canal Zone and ports less than 200 miles therefrom.

SEC. 2.—The master or other person being in charge of such vessel which leaves or attempts to leave any port of the Canal Zone in violation of any of the provisions of this order shall, upon conviction, be fined in a sum not to exceed Five Thousand Dollars ($5,000), and any such fine shall be a lien upon such vessel, and the vessel may be liable therefor in the District Court of the Canal Zone, and

the leaving or attempting to leave by any vessel from each and every port of the Canal Zone shall constitute a separate offence.

SEC. 3.—This order shall take effect from and after this date July 9th, 1914.

EXECUTIVE ORDER.

FREE RADIO SERVICE FOR CANAL BUSINESS.

Published in Circular No. 601-33, dated Balboa Heights, C.Z., November 17th, 1914.

Amending Paragraph 49 of the "Rules and Regulations for the Operation and Navigation of the Panama Canal and Approaches Thereto, Including All Waters Under its Jurisdiction."

By virtue of the authority vested in me under the Panama Canal Act, paragraph 49 of the "Rules and Regulations for the Operation and Navigation of the Panama Canal and Approaches Thereto, Including All Waters Under Its Jurisdiction," promulgated by Executive Order No. 1990, dated July 9th, 1914, is hereby amended to read as follows:—

49.—No radio tolls, either coast station or forwarding, will be imposed against ships on radiograms transmitted by ships on Canal business. There will be no charge made against the Panama Canal, by Canal Zone land lines or radio stations, for the transmission of radiograms to ships on Canal business.

PANAMA (REPUBLIC OF)

(See paragraph in italics, page 430.)

PARAGUAY

THE inland republic of South America known as Paraguay is divided into two distinct portions by the river bearing the same name. The first Spanish Colony was settled in 1535, and the country remained under Spanish rule until 1811. After a number of vicissitudes, the present constitution was proclaimed on the 25th November, 1870. The legislative authority is vested in a Congress of two houses, the executive being entrusted to a President, assisted by five Ministers.

CONTROL.

There are three wireless stations in Paraguay at present open to the public, their control being vested in the Director of Posts and Telegraphs. These stations are situated at Asuncion, the capital of the Republic (or—more strictly—Lambaré, on the outskirts thereof), Concepcion, and Encarnacion. They are identical in capacity and possess a radius of 300 miles by day and 600 miles by night. They were erected by Siemens Schuckert in accordance with a contract made with that firm and the Paraguayan Government in 1913. The Asuncion (Lambaré) station was completed in December, 1914, that at Concepcion in March, 1915, and that at Encarnacion was taken over by the Government in February, 1916.

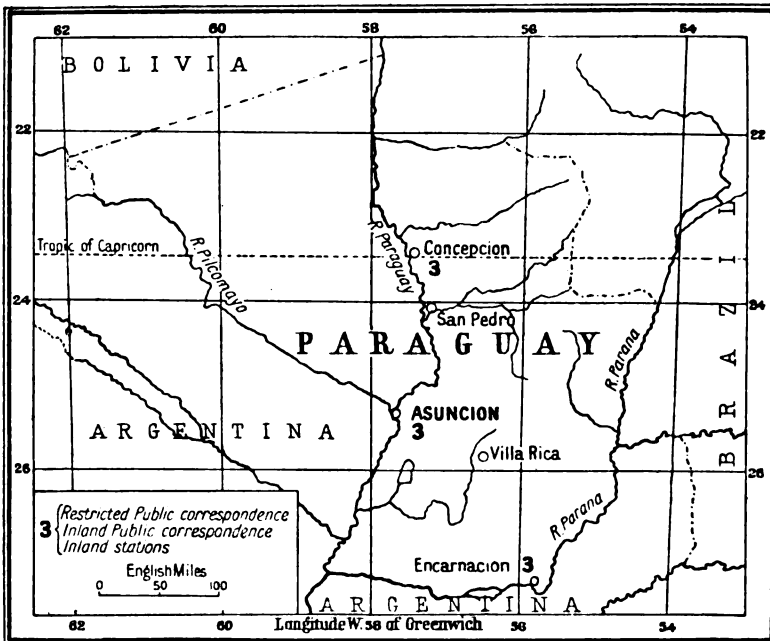
There are no privately owned stations. The Government has instituted a wireless telegraph school which is attached to the College of Military and Naval Cadets.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Dr. Luis A. Riart	Minister of Interior	Avenida Colombia, Asuncion
(*Vacant*)	Director-General of Posts and Telegraphs	Calle Yegros, Esq. Bermejo, Asuncion
Juan B. Tendil	Head of Telegraph Office	431 Calle Oliva, Asuncion
Francisco Fernandez ..	Technical Inspector	Calle 14 de Julio, Asuncion

ORGANISATION.

The Paraguayan wireless service is at present confined to the interior of the country, for the Governments of Paraguay and Argentina have not yet been able to come to a working agreement for the maintenance of a public service. An agreement, however, has been entered into by the two Governments to use wireless as an auxiliary to relieve congestion or breakdown of the line system. (*See Convention on next page.*)



The three Government installations are not confined to a specific Government service, but are available for the public service within the country, and occasionally, on emergency, for communication with the exterior.

The War Department have seven subsidiary, or portable, installations for use at the five military centres and on the armed patrol steamers.

ADMINISTRATION.

There are no special laws or regulations affecting the subject, but the text of the Convention referred to above will be found below.

A—Convention between Paraguay and Argentina.

CONVENTION.

A The following is the text of a Convention entered into between the Governments of Paraguay and the Argentine Republic.

Date of the Convention,
November 15th, 1918.

Plenipotentiaries—
For Paraguay: Dr. Eusebio Ayala.
For Argentina: Dr. José Maria Cantilo.

After an interchange of credentials, which were found in order, the following agreement was signed, the object of which is to facilitate communication between the two countries mentioned.

1. For the telegraphic interchange between Argentina and Paraguay radiotelegraphic methods will be used as an auxiliary whenever —owing to the amount of traffic or breakdowns in the terrestrial lines—it may become necessary to use wireless in order to maintain an uninterrupted service.

2. Both the Argentina and the Paraguay offices will use for the exchange of messages the Posadas and Formosa stations, one at a time, or the two if necessary. The two managements will see to it that the traffic is distributed in such a way as to ensure the quickest service between the hours between 12 noon and 12 midnight, Argentine time. The wavelengths will be of the standard damped type of 600 metres.

3. Whenever it is required, and should it be impossible to carry through the exchange over the stations named in the preceding article, the service may be taken off directly between Buenos Aires and Asuncion.

4. In all matters referring to transmission rates, accounts and service regulations, the Argentine and Paraguay regulations at present in force in the telegraphic service will apply.

5. This Convention will come into effect thirty days after its ratification by the contracting parties, and either party may withdraw at any time by giving 90 days' notice previous

to the date when the suspension of the service is intended to take effect.

This Convention is made out in duplicate and signed by the two plenipotentiaries whose seals have been affixed, and they have agreed that the exchange of the ratification will take place in the city of Asuncion within thirty days from this date.

PEMBA

(See ZANZIBAR.)

PERIM

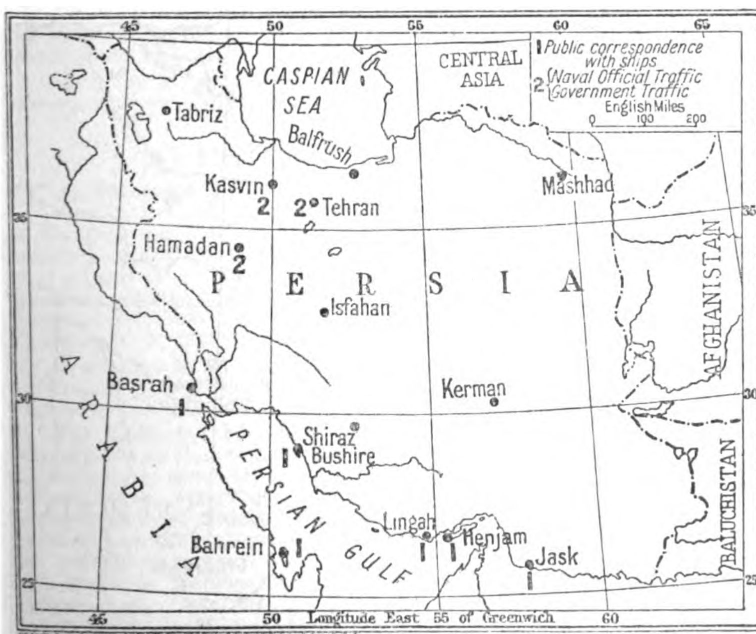
(See map on p. 170.)

PERSIA

THE agreement entered into with the Shah's Government lends an added interest to this country's relations with Persia. The country is divided into 33 provinces, and according to the most reliable estimates covers an area of about 630,000 square miles. The population exceeds nine millions.

The map shows the wireless stations in operation in Persia and on the Persian Gulf, all of which are in the hands of the British Military Authorities. The largest of these is at Jask on the Gulf of Oman. The French Legation in Tehran also possess a small wireless apparatus, but it is only used as a receiving station and has not the power necessary to transmit.

The wireless station at Bahrein was erected by the Indo-European Telegraph Department in January, 1916, and is controlled by the Director, Indo-European Telegraph Department, Karachi, India. There is one clerk in charge and two operators, and the station is open for Government and commercial traffic.



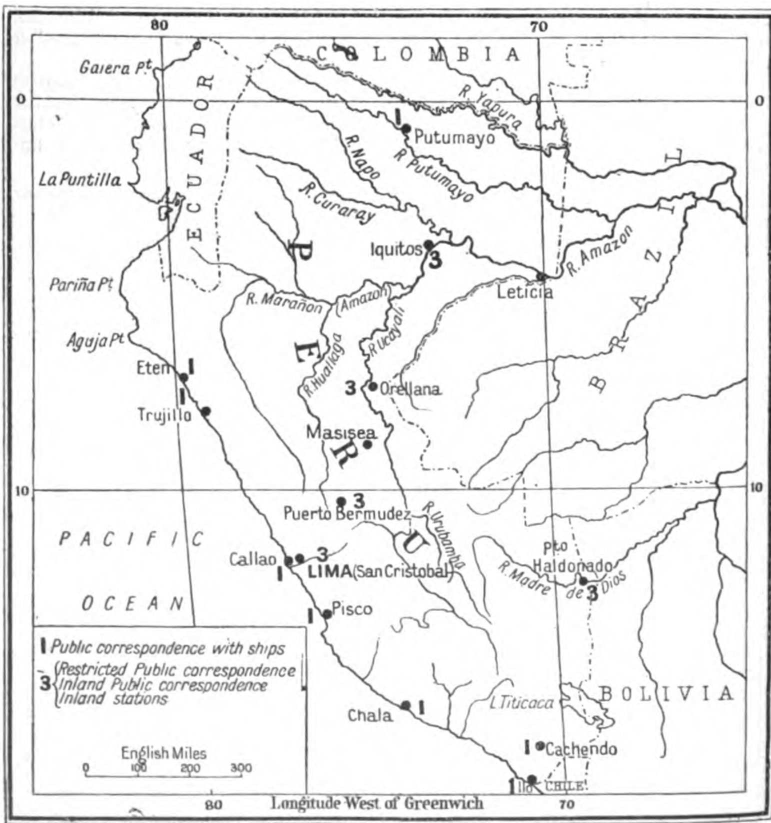
Basrah now official correspondence only.

There are three new stations run by the Russian Soviet Government at Astara (Russo-Persian frontier on Caspian littoral), Enzeli (South Caspian littoral), Tehran (Russian Soviet Legation). Also Russian armed vessels in the Caspian Sea are fitted with wireless apparatus.

There are no Persian wireless stations, no time, weather or press services and no Laws or Regulations affecting radiotelegraphy and radiotelephony.

PERU

THE Republic of Peru, formerly the most important Spanish Vice-royalty in South America, declared its independence on July 28th, 1821, but was not actually free until three years later. Its new constitution was proclaimed on February 4th, 1920, and entrusts the executive power to a President, the legislation being in the hands of a Senate and House of Representatives. Territorially it is divided into twenty departments and three littoral provinces, the total area being estimated at 532,617 square miles. The capital city is Lima, which is closely connected with Callao, its port on the Pacific coast.



CONTROL.

The control of radiotelegraphy is directed by the Minister of the Interior.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Sir William Slingo ..	Administrator-General of Posts and Telegraphs ..	Lima
Mr. S. R. Groser	Engineer-in-Chief of the Radiotelegraphic Service ..	Lima

ADMINISTRATION.

There are fifteen radiotelegraphic stations open to public service in Peru, but no special legislation has been issued, the wireless service being subject to the same regulations as the ordinary wired service, differing therefrom only with regard to rates.

The Radio Service has hitherto been a State monopoly and there are no forms of license in existence.

By virtue of an agreement with the Peruvian Government, Marconi's Wireless Telegraph Co., Ltd., on May 1st, 1921, took over the administration of the Postal Telegraph and Radiotelegraphic Services of the Republic and will operate them for a period of twenty-five years, Sir William Slingo, late Engineer-in-Chief of the British Post Office, having been appointed Administrator-General of Services.

The concession includes the sole and exclusive operation of all national and international wireless telegraph stations within the Republic and the exclusive right to erect any further wireless stations that may be necessary.

In accordance with the terms of the above agreement a programme of reconstruction and reorganisation of the Radio Service is in preparation, and it is anticipated that new laws and regulations affecting radiotelegraphy will in due course be drawn up.

There are at present no time, weather, meteorological, hydrographic or press services. No radio direction finding stations exist.

PHILIPPINE ISLANDS

THE Philippine Islands form a part of the great archipelago known as the East Indies. They lie south-east of the continent of Asia, nearly south of the Japanese Empire, and north of Borneo and Celebes; between the meridians of 116° 40′ and 126° 34′ east longitude, and between the parallels of 4° 40′ and 21° 10′ north latitude, that is entirely within the tropics. The boundaries and the limits of the group are set forth in the paragraph concerning limits in the Treaty of Paris between the United States and Spain, of December 10th, 1898.

In addition to the lands thus delimited, the United States subsequently acquired from Spain the little group of islands known as Cagayan Sulu, and nine other small islands, lying off the north coast of Borneo.

The Philippine Islands have an area of about 300,000 square miles, and are made up of some 7,000 islands. They have a population of 10,500,000, the majority of which are Christians. Considering the Philippine Archipelago by itself, it may be regarded as having the form of a triangle, open at the base and with its most acute angle pointing northward, this being represented by northern Luzon and the Batan and Babuyan Islands. The western leg of the triangle is represented by Palawan and dependent islands, and the eastern one by the Visayan Islands and Mindanao, with the Sulu sea lying between them.

These islands, and the mountain ranges upon them, have in general a trend which may be roughly described as northward and southward, although

certain of them, such as that forming the backbone of Palawan, trend nearly north-east and south-west, while others trend to the north-west and south-east.

The Philippine Islands are a possession of the United States, with a representative and practically autonomous government.

CONTROL.

Several of the stations now operated by the Philippine Insular Government were originally erected by the Signal Corps, United States Army, when that corps operated the telegraph and cable lines of the Philippines, but with the rest of the telegraph system of the Philippine Islands they were during the period from 1903 to 1907 gradually turned over to the Civil Government, the entire telegraph system, other than military lines and wireless stations, being now controlled by the Insular Government and forming a part of the Bureau of Posts.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
U.S. Army and Naval Stations		
Lieut. T. N. Alford.. ..	Philippine Communication Superintendent	Manila
Insular Government Stations		
Hon. Mr. D. Jakosalem ..	Secretary of Commerce and Communications ..	Manila
Mr. José Topacio	Director of Posts	Manila
Mr. W. H. Howard.. ..	Radio Engineer and Technical Adviser	Manila
Mr. V. P. Villanueva ..	Electrical Engineer of the Bureau of Posts	Manila

ORGANISATION.

Nearly all of the commercial wireless traffic of the Philippines is between shore stations, which form an integral part of the telegraph system of the Insular Government.



The Continental Morse alphabet is used on the wireless, and the American Morse alphabet on land and cable lines; and the radio laws and regulations of the United States are conformed to as far as local conditions permit. The service is operated and maintained almost entirely by Filipinos.

There are no wireless societies nor amateur or privately owned stations on record in the Philippines. There is one ship station on a Government owned vessel, and several ship stations on privately owned vessels.

There are seventeen land station open for general public service, and some of the stations operated by the United States Army and Navy are open to ship and foreign traffic, ten of them being operated by the Bureau of Posts. These include five operated by the United States Army or Navy, but not ship stations licensed by the United States Government.

The Philippine Insular Government has an extensive programme for the erection of additional wireless stations, and the erection of 18 new wireless stations in different parts of the archipelago is now under way.

The Bureau of Posts stations are designed strictly for commercial business and the relief of the cable system. Therefore, there has been no provision for radio compass stations, nor are there any regulations relative to aviation at present. The Bureau of Posts is, however, taking up the question of aerial mail service between the various islands, and it is possible that if such should become a reality there would be regulations in force and several radio compass stations erected.

A comprehensive system of time and weather signals is in operation in these islands.

ADMINISTRATION.

At present it is not possible to give the actual text of the laws regarding radio work. They are, however, practically the same as those in force in the United States, with a few exceptions due to local conditions.

Bills similar to the Radio Act and Ship Act of the United States, regulating radio communication and requiring radio apparatus on certain passenger carrying vessels respectively, will soon be presented before the Philippine Legislature for passage.

POLAND

THE historic Kingdom of Poland has recently been rightly restored to its former position. Its record has been an unhappy one, culminating in its third and last partition between Austria, Prussia and Russia in 1795, this division being subsequently rearranged by the Congress of Vienna in 1815, so that the original shares of Prussia and Austria were diminished.

CONTROL.

Normally the establishment and control of radiotelegraph stations is vested in the Ministry of Posts and Telegraphs, to whom it is expected to revert from the military authorities before the commencement of the present year. It is proposed to establish a wireless telegraph department (as a branch of the Ministry of Posts and Telegraphs) for dealing with all matters relative to radiotelegraphy and radiotelephony.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Dr. Wladislaw Steslowicz	Minister of Posts and Telegraphs	Warsaw
Wlodzimierz Dobrowolski	Engineer	Warsaw
Wladyslaw Gadomski..	Secretary of the Minister of Posts & Telegraphs	Warsaw
Eugenjusz Stalinger	Chief of Radiotelegraphic Section	Warsaw

ORGANISATION.

In anticipation of a great development of wireless telegraphy and telephony after the termination of the military operations, an Inter-Ministerial Commission was formed as in France, Italy and Russia, for the purpose



of studying the problems connected with the further development of wireless telegraphy, which is regarded as one of the most important of the up-to-date means of communication over long distances.

The following are the wireless stations which either exist or are soon to be opened in Poland: A 5-kw. Telefunken at Warsaw, a 4-kw. Poulsen at Cracow, a 5-kw. Telefunken and 4-kw. Poulsen at Posen (to be opened for public correspondence), a 10-kw. S. F. R. at Grudziadz (under construction), followed by other stations. Independent of these the construction has been commenced of a large transatlantic radiotelegraphic station on the Alexanderson system of 400-kw., near Warsaw. Service for aviation and meteorology, as well as the Press, will be established. There are also a number of military field stations.

The Central Wireless station acts mostly as a transmitting station, which is explained by its situation in the capital, which is the seat of the highest military and civil authorities, but it also receives a small quantity of press *communiqués*, whereas the Posen and Cracow wireless stations are almost exclusively engaged in receiving press *communiqués* sent to the capital by wire or by telephone.

After the results of the experiments with a receiving station fitted with a "frame antenna," a station of this type will be erected at Warsaw in the near future exclusively for receiving press news. The Polish permanent wireless stations are receiving systematically commercial and meteorological *communiqués* from all most important foreign places, whilst the Warsaw Central Station is transmitting daily a press and meteorological *communiqué*.

ADMINISTRATION.

The existing rules and regulations respecting the wireless service are of a temporary nature, and for military use only. They will soon be replaced by regulations established by the civil authorities.

PORTO RICO

(See PUERTO RICO.)

PORTUGAL

(See map on p. 480.)

AN independent State since the twelfth century, " England's Oldest Ally " remained a monarchy till 1910. On October 5th of that year the Republic was proclaimed, and on August 20th, 1911, the present constitution was established. Affairs are administered by a President, the two Chambers reserving to themselves the legislative functions.

Portugal is a country with 5,500,000 inhabitants, and has a superficial area of 49,792 square miles (including the archipelago of the Azores and Madeira Island). She claims to be the pioneer colonising nation of the modern world.

From 1418 to 1557, the great exploration period of the Portuguese, they conquered vast territories in Africa, Asia, America and Oceania, some of which they lost in India and America, when Brazil proclaimed its independence in the year 1822. Nevertheless, the Portuguese colonies still cover an area of 1,111,572 square miles.

CONTROL.

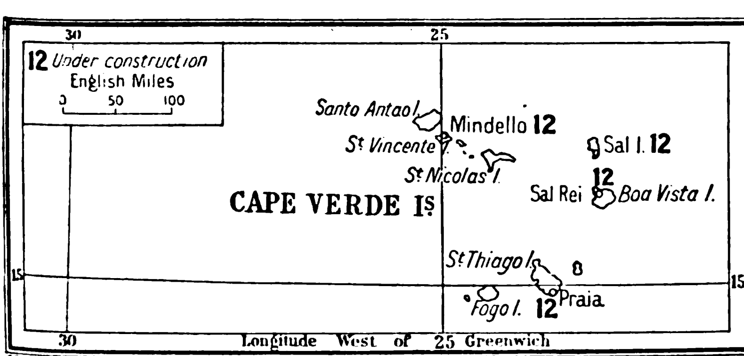
The radiotelegraphic service in Portugal is a state monopoly. No private individual is allowed to erect or work wireless, and may not even own a simple receiver. The only exception made is that in favour of shipping companies, which are allowed to have wireless stations on board their vessels.

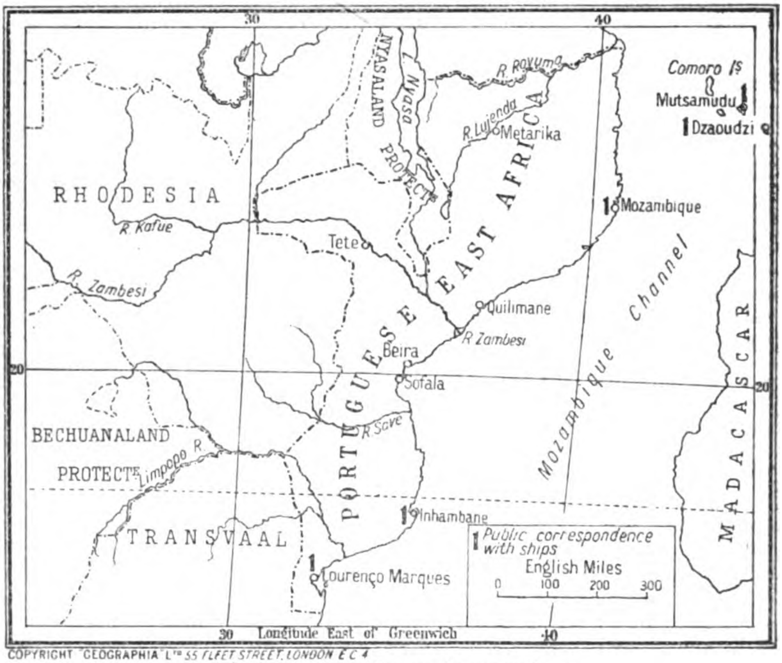
OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Dr. João Alberto Pereira de Azevedo Neves	Minister of Commerce	Lisbon
Sr. Henrique Jacinthe Ferreira de Carvalho	Postmaster-General	Lisbon
Colonel Alvaro Cesar de Mendonça	Minister of War	Lisbon
Sr. Manuel Alves de Mattos	Inspector of Telegraphic Military Service	Lisbon
Dr. Alexander de Vasconcellos e Sá	Minister of Colonies	Lisbon
Admiral Canto e Castro	Minister of the Navy	Lisbon
Admiral D. Bernardo da Costa	President of the Technical Committee of Torpedoes and Electricity	Lisbon

STATIONS IN PORTUGAL (INCLUDING AZORES).

There are no private stations and no amateur stations, for wireless is a state monopoly. The experimental stations at the School of Torpedoes





Beira is open for public general correspondence.

and Electricity at Valle de Zebro are confined to the station of the Naval School.

Land stations open for Government traffic only ..	1
Land stations open for public correspondence.. ..	2
And a number of ship stations open for public correspondence.	

Portuguese East Africa.

Land stations open for public correspondence.. ..	3

Cape Verde Islands.

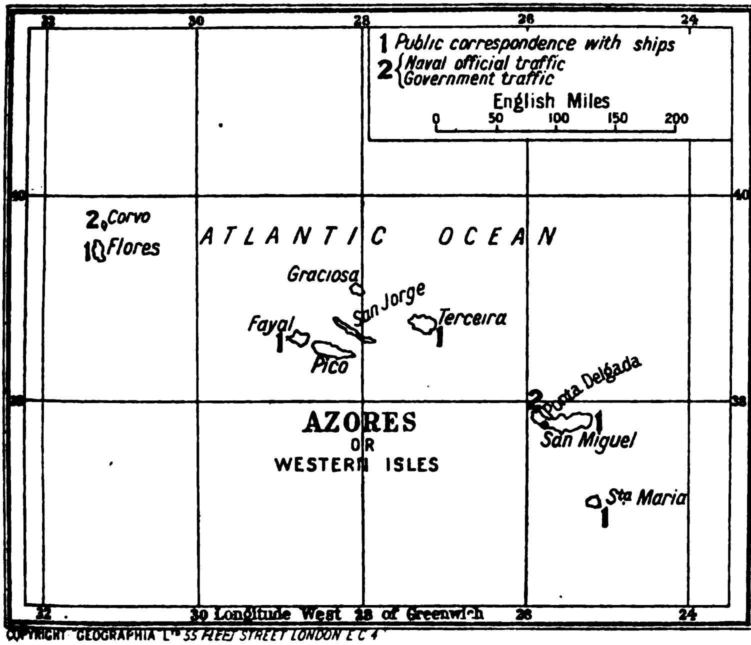
Land stations	4

ORGANISATION.

Portugal's first experiments in wireless telegraphy date from 1905, and were conducted with two small Telefunken stations on a war vessel and the fortress of Cascaes, by the staff of the Posts and Telegraphs. The results, however, were not very satisfactory. Later on, Alvares, Captain of Engineers, carried out experiments on a small scale with two Decretet stations having coherer receivers. In 1907 the first fixed station was set up at the School of Torpedoes and Electricity at Valle de Zebro (Escola de Torpedos e Electricidade).

With this Naval station a series of experiments were made, and it was here that the first studies in wireless originated, and the first officers and sailors of the Portuguese Marine received instruction.

The whole work of installation, tests, and tuition was directed by the naval officer who, at the time, was the instructor at the School of Torpedoes



and Electricity, and who was in charge of the Wireless Telegraphy Department.

Nowadays the School of Torpedoes and Electricity at Valle de Zebro, besides having the old apparatus for instruction, possesses a complete Marconi station with all the receivers used in the Navy, and continues to be a Naval School for officers and sailors.

Radiotelegraphy has made considerable headway, especially in the Portuguese Colonies.

Contracts have been entered into between the Colonial Office and the Marconi Company for stations at Timor (Java) and a network of stations at Angola (West Africa). A complete system of installations has been arranged for São Thomé (Gulf of Guinea) and for Mozambique (East Africa). The present Minister of Colonies, Dr. Alexandre de Vasconcellos e Sá, is responsible for the execution of this project.

The Administration of Posts and Telegraphs have also purchased a 5-kw. station for Terceira Island (Azores).

ADMINISTRATION.

The current laws and regulations reprinted below comprise :—

A—Act of July 15th, 1913.

B—Regulations.

C—Decree of April 8th, 1916.

D—Decree of March 29th, 1917.

THE ACT OF JULY 15TH, 1913.

A 1. On the expiration of a period of three months from the approval of the Regulations for the execution of the present law, no Portuguese steam vessel, with accommodation for more than fifty passengers (including crew), shall be permitted to sail from any port without having installed a wireless telegraph apparatus of the system which suits it best, in good working order, and capable of despatching and receiving radiotelegrams within a radius of action which must never be less than 100 miles.

(*a*) From this provision those steamers are excepted which navigate only between ports situated at distances of less than 200 miles.

(*b*) For steam vessels, which navigate in the Colonies where there are coastal radiotelegraph stations, and which only occasionally come to the Metropolis, the period granted for the installation of wireless telegraphy, to which the present article refers, shall be six months.

2. The wireless telegraph material of a vessel, and the respective service of transmission and reception of radiotelegrams, shall be under the charge of one or more duly qualified telegraphists.

§ The number of telegraphists, their qualifications, and that of the indispensable auxiliary staff, the organisation of their technical instruction, provisions with respect to the service of supervision, conditions of the installation of the apparatus, and the official verification of their working, shall be determined pursuant to the Regulation drawn up for the execution of the present law.

3. It is the province of the captain of the vessel to give instructions and orders for the complete carrying out of the laws and regulations in force with respect to the radiotelegraphic service, and he shall exercise the necessary supervision, carrying out and causing to be carried out any provisions which he may consider advantageous for the good working of the said service.

4. The captain shall be held responsible for any negligence in complying with the requirements of Article 1, and on conviction he shall be liable to a fine not exceeding Rs.200 and the suspension of his master's certificate for one year.

5. Negligence or failure on the part of the captain to carry out the provisions of Article 3 shall render him liable to a fine not exceeding Rs.50, which may be accompanied with imprisonment not exceeding one month after the first offence.

6. If there should be a disaster, stranding or loss of the vessel, resulting from the lack of vigilance of the telegraph staff, and the said fault was due to the negligence of the captain in failing to carry out and causing to be carried out the provisions in force relating to the radiotelegraph service, the captain shall be liable to a fine not exceeding Rs.200, accompanied or not, according to the gravity of the offence with suspension of his certificate for a period of from one to five years.

If the serious injury, or the death, of one or more persons should result from the disaster, the penalties applicable shall be respectively those laid down in Articles 368 and 369 of the Penal Code.

7. The offences referred to in Articles 4, 5 and 6 constitute maritime crimes, and shall be judged by the Commercial Maritime Tribunal pursuant to the disciplinary Code of the Mercantile Marine.

8. All the wireless apparatus intended for Portuguese vessels shall be exempt from Customs and Municipal Duty.

9. Any legislation contrary hereto is hereby repealed.

REGULATIONS.

B The following regulations were issued on August 29th, 1913:—

1. Ships may be equipped with any wireless telegraph apparatus which is in keeping with scientific progress.

2. The shipping or any other company may establish and work a wireless telegraph station on board ship. The station must possess a license granted by the Government of the nationality to which the ship belongs. The "class" of the station is mentioned in the license.

3. There are three classes:—

(*a*) Long voyage passenger steamers with accommodation for more than 150 passengers must maintain continuous service.

(*b*) The same type of steamer with accommodation for less than 150 passengers must maintain continuous *receiving* service, whereas the transmission may be limited.

(*c*) Cargo or fishing boats, or vessels carrying more than 50 persons (including crew), may have limited service.

4. and 5. Wavelength of 300 m., 600 m. and more than 1,800 m. may be employed. Small boats may work on a 300 m. wave when sending, but 600 when receiving. The waves must be as pure and as undamped as possible.

The oscillator must not be directly connected to the antennæ, except in case of distress, or on certain small steamers where the energy employed in the primary does not exceed 50 watts.

6. The cabin must be divided into two parts so that the transmitting gear and the spark gap may be separated from the receiving apparatus. Double walls must be used to isolate the interior from the exterior.

7. The instruments must be able to receive and send 100 letters per minute.

8. New installations employing a power of more than 50 watts must possess such arrangements as will enable them to have a range inferior to their normal, the smallest being approximately 15 miles. All old stations must be brought to this standard as soon as possible.

9. The receiving instruments must be able to tune for waves up to 600 m., being highly protected against perturbations.

10. The power measured at the terminals of the generator must not exceed 1 kw. in normal circumstances. An increase is allowed when a station desires to communicate with a land station other than the nearest, at a distance of more than 200 miles from the nearest land station, and when, in exceptional circumstances, the communication cannot be effected with 1 kw.

11. First and second-class steamers must carry an emergency set in as safe a place as is possible. The emergency set must be able to work for six hours at least at a distance of 80 miles for first class, and 50 miles for second-class steamers.

12. The apparatus must be operated by a telegraphist who possesses a certificate from the Portuguese Government, or, in urgent cases

and for one trip only, from any other Government which has signed the International Convention:

13. There are two certificates:—
  (a) 1st Class (same as International).
  (b) 2nd Class (12 words, adjustment of apparatus, knowledge of each instrument and its work, and rules *re* handling of telegrams).

Service.—Any member of the crew able to assist the telegraphist in his work, and possessing a knowledge of the operation of the apparatus, may be an "auxiliary" operator.

14. Second-class telegraphists may be employed on board where the wireless service is only for the shipping company's requirements or on fishing vessels, or they may act as assistants in cases where there is already one first-class operator. On first-class steamers *two* first-class telegraphists must be employed.

15. On second-class steamers, one first-class and one second-class telegraphist should be employed; on third-class vessels one second-class telegraphist will suffice.

Service.—As long as land stations do not exist in the Portuguese Colonies, Portuguese steamers plying there are allowed to carry one first-class telegraphist and one "auxiliary."

16. Transmitting must be performed by a first or a second-class telegraphist, except in urgent cases.

17. The certificates state that the telegraphist has taken an oath of secrecy with regard to the correspondence.

18. The captain has authority over the working of the station.

19. Portuguese operators are preferred.

20. Should none be obtainable, foreigners may be employed if they are in possession of the Portuguese Government's certificate.

In urgent cases where no certificated telegraphist is available, provisional certificates may be issued for one voyage.

21. Certificates are supplied by the Commission after the examination of the telegraphist.

22 and 23. Captains are also bound by an oath of secrecy.

32. All telegrams sent and received on board must be registered by the captain on forms supplied by the Government. The date and hour of the sending or reception of these telegrams must be indicated.

33. Only the telegraphists and the captain are allowed to enter the wireless cabin.

34. The wireless room and the bridge must be connected by either a speaking tube or a telephone, unless they are within easy distance of one another.

Decree of April 8th, 1916.

C This decree forbids the installation of either wireless transmitting or receiving stations, but Government can authorise the setting up of receiving stations only.

These said stations, when authorised by Government, are subject to its control, and whenever Government may judge convenient, it may withdraw the same authorisation without any indemnification.

The owners of these stations have to pay in advance the tax of Escudos $5.50 per annum.

Anyone who sells wireless material is obliged to send to the Government a statement of the material sold, with the names of the persons who have purchased it to identify them. Those who do not fulfil this identification will pay the fine of Escudos $20.00 to $100.00, and all the material that he has for sale will be seized by the Government, and will belong to the Government. In case of a second offence he will be prosecuted.

The owner of any receiving station, or any person who may have made use of the same station, and who divulges contents of messages that have been received by such station incurs a penalty.

In case of a second offence he is subject to imprisonment for six months to a year, and a fine.

Decree of March 29th, 1917.

D In consideration of the highest interest of the State, it is undesirable in the existing circumstances that private persons should possess wireless apparatus of any kind, or make use of the same apparatus.

It has been decided that it is desirable to confine the employment of such apparatus to schools of observatories, so as to limit the risk of misuse; and availing ourselves of the authorisation granted by the Executive Power by the Laws Nos. 373 and 491 of September 2nd, 1915, and March 12th, 1916,

We decree by the proposal of the Minister of Works and Social Providence, the following:—

Art. 1.—It is expressly forbidden to private persons to possess or make use of wireless apparatus and fittings, or to import or sell to the public the said apparatus and accessories.

Art. 2.—The owners—whatever they may claim to be its purpose—of apparatus and wireless accessories without conducting wires, will have to deliver the said articles for deposit against receipt; in Lisbon, at the warehouses of the Material of the Posts and Telegraphs; in Oporto, at the Secretary's Office of the Second Electric Circumspection; and in the other capitals of the administrative districts of the continent and adjacent islands, at the Secretary's Offices of the Electric Sections and Sub-sections, or of the Post and Telegraph Service.

The deliveries in deposit to which this article refers will have to be effected for the Continent of the Republic, in the maximum period of five days from the date when this Decree is published in the "Diario do Governos"; for the adjacent islands in the same period reckoned from the date when the same daily paper reaches there.

Art. 3.—The apparatus and wireless fittings without conducting wire that are in the Government Teaching Institutions, and at the Astronomical and Meteorological Observatories, in the first case for the purpose of demonstration, and in the second case for scientific tests, are to be under the safe keeping of the directors of the same institutions and observatories, and will be used only for those purposes and in the presence of the said directors and under their entire responsibility, in the presence of the respective teachers and observers.

Art. 4.—He who transgresses the stipulations of this Decree incurs a penalty of Escudos $20.00 to $100.00, which will be fixed and collected by the Administration of Posts and Telegraphs; when it is paid voluntarily, the same Administration will order all the material to be seized, which will then belong to the Government.

In case of a second offence the fine will be fixed at its maximum.

If the fine is not paid voluntarily, the transgressors will be handed over to the judiciary, in order to be judged and the penalty imposed by the correctional police.

In Lisbon and Oporto the jurisdiction will concern the tribunal of transgressions.

ART. 5.—This Decree will come into force immediately, and will be valid to the end of the European War, after which the apparatus and wireless fittings which were voluntarily delivered will be returned to their owners, against receipt as to the conditions of Article 2.

ART. 6.—All legislation to the contrary is hereby revoked.

PORTUGUESE EAST AFRICA

(See PORTUGAL.)

PORTUGUESE GUINEA.

(See map on p. 264.)

THIS Portuguese Colony, situated on the West Coast of Africa, is bounded by the limits fixed by the Convention with France held on May 12th, 1886, and is entirely enclosed on the land side by French possessions. The chief products are oilseed, ivory, wax, rubber and hides. The capital city is Bolama.

ORGANISATION.

The wireless telegraph installation has not yet been completed but all the apparatus has been received and there are three stations in the course of erection.

ADMINISTRATION.

No laws or regulations exist yet for the administration of wireless telegraphy in this territory.

PORTUGUESE WEST AFRICA

This Colony, otherwise known as Angola, possesses a coast line of over 1,000 miles and is bounded on the north by the French Congo, on the east by the Belgian Congo, and on the south by The Union of South Africa. The colony has been in the possession of the Portuguese since 1575, with the exception of a period of seven years (1641-1648), when it belonged to Holland. The territory is under the jurisdiction of a Governor-General, whose headquarters are at Loanda, the capital.

CONTROL.

Radiotelegraphy in the Colony constitutes a Government monopoly. All matters in relation thereto are in the care of a Board, under the presidency of the Governor. The Director of the Radiotelegraphic Service and the leading officials have a seat on this Board.

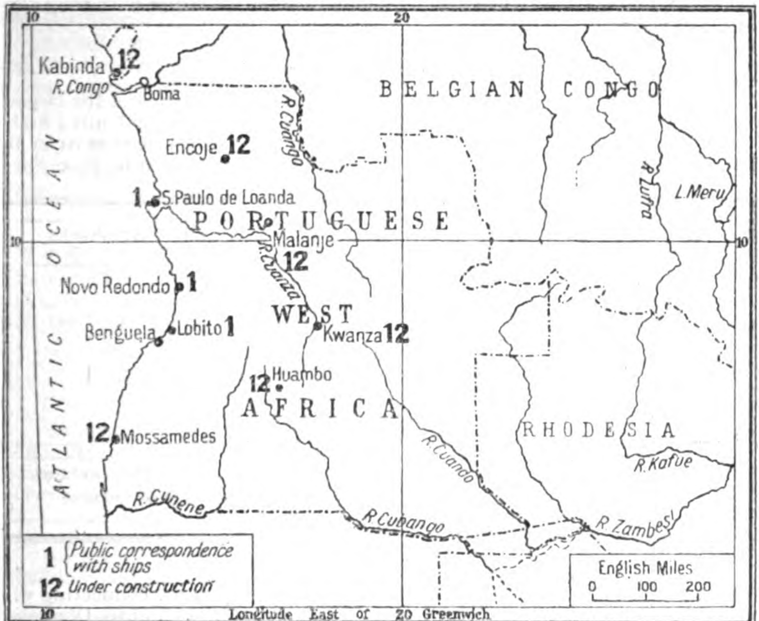
OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Commander Luiz Couceiro	Director of Radiotelegraphy	Loanda
Sr. Arnaldo de Paiva Carvalho	Assistant Engineer	Loanda

There are also a number of station superintendents, telegraphists, electricians and mechanics. Up to the present no stations other than Government stations are allowed. There are no aviation or meteorological stations.

ORGANISATION.

The decree for the creation of a wireless service in the Province of Angola was gazetted in Lisbon on September 23rd, 1918. The scheme includes: One 15-kw. station at Loanda; twenty-two 3-kw. stations at Cabinda,



Mossamedes open for public general correspondence. Kwanza closed.

Maquela, Encoge, Malange, Luio, Saurimo, Novo Redondo, Lobito, Huambo, Quanza, Moxico, Caquengue, Mossamedes, Lubango, Mulongo, Cuanhama, Posto A, Cuangar, Cangamba, Caiundo, Dirico and Luati; nine $1\frac{1}{2}$-kw. field stations (type F); two $\frac{1}{2}$-kw. pack stations for the army.

These are followed by three field stations, for public and official service, situated respectively, and as a temporary measure, at Loanda, Novo Redondo and Lobito. The three latter are in the nature of experimental stations for testing the best means of arranging for future traffic.

ADMINISTRATION.

The Laws, Regulations, etc., governing the administration of wireless telegraphy in this territory are identical with those used in Portugal.

PUERTO RICO

THE island of the "Greater Antilles" group in the West Indies known under the Spanish name of Rich Harbour lies with regard to latitude between 17° 50′ and 18° 30′ N.; its longitude ranging from 65° 30′ to 67° 15′ W., and its total area comprising 3,606 square miles. The capital, San Juan, is 1,400 miles from New York and 982 from Key West, Florida. It is administered by a Governor appointed by the President of the United States, with a Cabinet composed of an Attorney-General, a Commissioner of Education, a Commissioner of Agriculture and Labour, a Commissioner of the Interior, a Commissioner of Health, and a Treasurer of Porto Rico; and a Senate and a House of Representatives elected for four years. With the exception of the Attorney-General and the Commissioner of Education, who are appointed by the President of the United States for four years, all of the

other members of the Cabinet are appointed by the Governor with the advice and consent of the Senate of Porto Rico, also for four years.

CONTROL AND ORGANISATION.

The regulation of wireless telegraphy rests in the hands of the Department of Commerce for private stations and in the hands of the United States Navy Department for the Naval Section. No clubs or societies exist in the island. There are private stations worked by the South Porto Rico Sugar



Company of Porto Rico (sugar factory), at Ensenada, P.R., connecting with Central Romana (a similar company in the Republic of Santo Domingo). The Ensenada station, owned by the South Porto Rico Sugar Company, is being operated under a general commercial license granted by the U.S. Navy Department, Washington, D.C. It communicates directly with the Romana station, the Santo Domingo City public station, and San Pedro de Macoris station, in the Republic of Santo Domingo; also with ships at sea.

The radio station at San Juan sends out a meteorological bulletin every night at 9 p.m., 75th meridian time, on 2,750 metres, audible radiation. Hydrographic and emergency weather reports are sent when received and also at 8, 12, 16, and 20, 60th meridian time. No time or press signals are sent.

There are no direction finding stations in Porto Rico at present.

There are two stations belonging to, controlled and operated by, the Navy Department of the United States in Porto Rico, one in the city of San Juan and the other in the city of Cayey, P.R.

ADMINISTRATION.

The Laws and Regulations affecting the Naval Radio Stations in Porto Rico are as follows :—

The International Radio Convention ;
The National Radio Laws of the United States ; and the
Navy Regulations and Communication Instructions.

RHODESIA

CECIL RHODES, the "Colossus of South Africa" (*floruit* 1853-1902) has bequeathed his name to British Colonies covering an area of over 438,575 square miles. Rhodesia is bounded on the south by the Transvaal, on the north by the Congo State, and the Kenyaland Colony. On the east

lies Portuguese East Africa, and on the west the Belgian Congo, Bechuanaland, and Portuguese West Africa.

For administrative purposes this vast territory is divided into Northern and Southern Rhodesia, the Rhodesian Chartered Company governing under the prescription of British Orders in Council.

Northern Rhodesia

In this Administrative Division the headquarters are located at Livingstone, and the district is mainly agricultural.

ORGANISATION.

With regard to Aviation Stations in this territory, aerodromes were constructed at Abercorn (close to Lake Tanganyika), Ndola, Broken Hill and Livingstone (the three latter being all on the railway line) in connection with the Cairo to Cape air flight, and these are to be maintained.

Southern Rhodesia

CONTROL.

Wireless Telegraphy is under the control of the Department of the Administrator, and the principal assistants of the Postmaster-General in such matters are the Government Electrical Inspectors at Salisbury and Bulawayo. There are no wireless clubs or societies.

ORGANISATION.

No licenses have yet been issued for wireless installations in Southern Rhodesia, and the form of license has not been fixed.



ADMINISTRATION.

Southern Rhodesia, whose centre is at Salisbury, regulates radiotelegraphy within its border by the "Electric Telegraph Amendment Ordinance" of 1904, and sundry Notices of 1912, the text of which will be found below.

It is possible that legislation and regulations will become necessary in connection with aerial navigation which is now in course of development, and efforts are being made to secure, as far as possible, uniformity with the proposed laws and regulations of the Union of South Africa on this subject.

No permanent arrangements have yet been made for the transmission of time and weather and meteorological signals.

A—Electric Telegraph Amendment Ordinance, 1904.
B—Postal Notice No. 55 of 1912.
C—Government Notice No. 391 of 1912.

TELEGRAPH (AMENDMENT) ORDINANCE.

A The term "electric telegraph" whenever used in the "Electric Telegraph Act, 1861," or any law amending the same or relating to "electric telegraphs," shall be interpreted as including any system or means of conveying signs, signals, or communications by electricity, magnetism, electro-magnetism, or other like agency, and whether with or without the aid of wires, and including the system commonly known as wireless telegraphy, or ætheric signalling, and any improvements or developments of such system; and the term "line of electric telegraph" shall be interpreted as including any apparatus, instrument, mast, standard, wire, substance, matter, or thing whatever, which is, or may be, used for the purpose of sending, transmitting, conveying, or receiving such signs, signals, or communications.

2. The meaning of the term "person" shall be further extended so as to include individuals, partnerships, companies, and corporations.

3. The provision of the first section of the said Act as to its application to Southern Rhodesia shall be read and construed as including the territorial waters thereof.

4. Within Southern Rhodesia, or the territorial waters thereof, no person not thereto expressly authorised by some law shall erect or make use of any mast, standard, or apparatus of any kind, for the purpose of signalling without wires by means of electricity, magnetism, electro-magnetism, or other like agency, or shall erect or construct any line of electric telegraph, except under a license to be granted by the Administrator.

5. The Administrator may authorise the issue of a license for the establishment or use of any apparatus or installation for the transmission of signs, signals, or communications, by electric telegraph, with or without the aid of wires, and may revoke the same at any time, and there shall be payable annually in respect of such a licence such sum not exceeding One Hundred Pounds sterling, as may be fixed by regulation.

6. The terms and conditions of such license, and the duration thereof, shall be subject to such regulations as may from time to time be made by the Administrator.

7. Any person who shall establish or use, or attempt to establish or use, any such apparatus or installation as is mentioned in Sections 1 and 4 of this Ordinance, in contravention of the provisions thereof, or of any other law relating to electric telegrapns, or of any regulation thereunder, shall be liable upon conviction to forfeit all apparatus so used, and to a penalty not exceeding Two Hundred and Fifty Pounds, and, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, and, in case of a second or subsequent conviction, in addition to such forfeiture to a penalty not exceeding Five Hundred Pounds, or in default of payment to imprisonment, with or without hard labour, for a period not exceeding six months.

8. Any Magistrate or Justice of the Peace before whom information shall be given on oath by credible persons, that the provisions of this Ordinance are being, or have been, or are likely to be infringed, may issue a search warrant, and authorise the seizure of any instruments, apparatus or appurtenances reasonably suspected to be intended for use in such contravention.

9. Notwithstanding the provisions of Section 4 of "The Electric Telegraph Act, 1861," all regulations made under the authority of that Act shall be published in the *Gazette*, and be subject, *mutatis mutandis*, to the provisions of Section 7 of Act No. 5 of 1883 of the Cape of Good Hope.

10. This Ordinance may be cited as the "Electric Telegraph Amendment Ordinance, 1904," and shall be read as one with "The Electric Telegraph Act, 1861," of the Cape of Good Hope, and the "Telegraph Protection Ordinanoe, 1901," and the said laws may be cited together as the "Electric Telegraph Laws, 1861 to 1904."

POSTAL NOTICE No. 55 OF 1912.

B Public attention is hereby directed to the provisions of the "Electric Telegraph Amendment Ordinance, 1904," under which no person not thereto expressly authorised by some law shall erect or make use of any mast, standard or apparatus of any kind for the purpose of signalling without wires by means of electricity, magnetism, electro-magnetism or other like agency, or shall construct any line of electric telegraph except under a licence to be granted by the Administrator.

The term "Line of Electric Telegraph" is defined as any apparatus, instrument, mast, standard, wire, substance, matter or thing whatever which is or may be used for the purpose of sending, transmitting, conveying or receiving signs, signals, or communications.

All persons having, or desiring to have, such lines of electric communication, including telephone lines, whether on their private property or otherwise, are hereby notified

that application for license to use such lines must be made to the Administrator through the Postmaster-General.

The license fees payable in respect of such lines, as published in Government Notice No. 391 of 1912 are as follow:—

(*a*) 1s. per annum for a private telephone or telegraph line exclusively on the private property of the person constructing and using the same;

(*b*) 10s. per annum for a private telephone or telegraph line passing beyond the boundaries of the owner's land. (The license does not confer any right to erect telephone or telegraph lines outside the boundaries of the applicant's land, and the applicant must make his own arrangements in this regard);

(*c*) £50 per annum for any installation of wireless telegraphy or telephony.

All persons having in use lines of electric communication which have not been authorised by the Administrator are hereby notified that unless the required permission be applied for within one month of the date of publication of this Notice they will render themselves liable to the penalties provided in Section 7 of the Telegraph Ordinance above referred to.

GOVERNMENT NOTICE.

No. 391 of 1912.

DEPARTMENT OF POSTS AND TELEGRAPHS.

The Treasury, Salisbury,
December 19th, 1912.

C It is hereby notified for public information that His Honour the Acting Administrator, with the advice of the Executive Council, has been pleased to approve of the following Regulations regarding the issue of licenses for installations of private telephones, telegraphs, or other means of electric communication, whether with or without wires, in terms of section 5 of the "Electric Telegraph Amendment Ordinance, 1904."

By command of His Honour the Acting Administrator in Council.

P. D. L. FLYNN, Acting Treasurer.

When any person is authorised to establish or use any means of electric communication as defined in the "Electric Telegraph Amendment Ordinance, 1904," the Postmaster-General may issue to such person an annual license for the use of such line on payment in advance of the undermentioned fees, namely:—

(*a*) 1s. per annum for a private telephone or telegraph line exclusively on the private property of the person constructing and using the same;

(*b*) 10s. per annum for a private telephone or telegraph line passing beyond the boundaries of the owner's land. (The license does not confer any right to erect telephone or telegraph lines outside the boundaries of the applicant's land, and the applicant must make his own arrangements in this regard);

(*c*) £50 per annum for any installation of wireless telegraphy or telephony.

ROUMANIA

THE country was formed by the fusion of the two Principalities of Moldavia and Wallachia on December 23rd, 1861, and its first ruler was Colonel Cuza, who had, in 1859, been elected "Hospodar" or "Lord" of the two Principalities. He assumed the Government under the title of Prince Alexandru Joan I. The total population is about six millions. It has not yet been possible to obtain the text of any radiotelegraphic laws and regulations, but it is hoped to include these in our next edition.

CONTROL.

All wireless telegraphic or telephonic services and stations are owned and operated by the State under the Direction Special of Radio Communications which forms part of the Ministry of Communications.

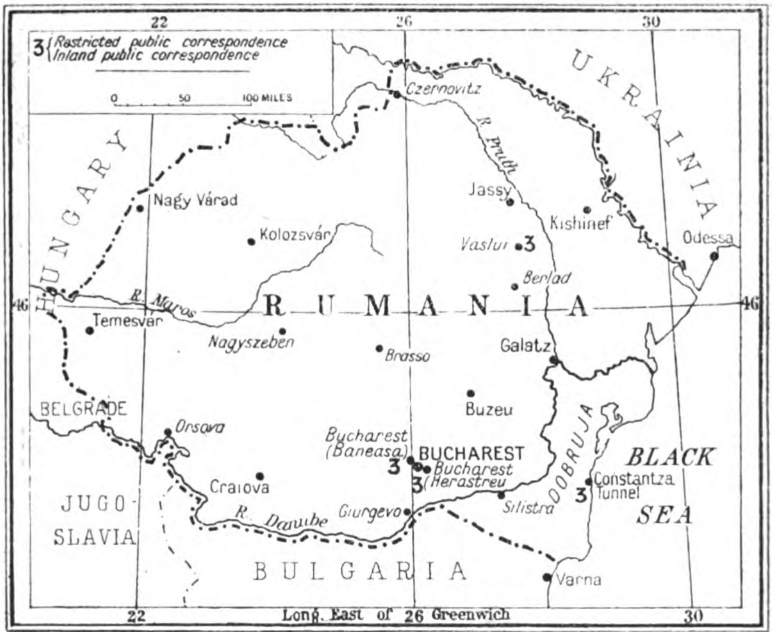
Authority to possess installations is given to scientific institutions, and also to those engaging in special wireless research work.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
M. Emile Giurgea, Dr. Sc.	Director of Radio Communications	Str. Renasterei, Nr. 6, Bucharest
M. Cottesco	Wireless Engineer in the Wireless Service..	Bucharest
Capt. E. Geles	Wireless Engineer, Military and Marine ..	Bucharest
M. B. Nicolesco-Dorobanto	Engineer in the Wireless Service	Bucharest

The following is the position regarding the wireless stations in Roumania:—

International Service Stations	3
Interior Service Stations	3
Military and Fluvial	4
Under construction	27



ORGANISATION.

In 1915 Bucharest was cut off from telegraphic communication with the West, and an improvised wireless station of 8–10 kw. (50 cycles) was constructed from laboratory apparatus. A second station with an alternator (100 cycles) was also constructed in the Carol Park, Bucharest, by means of which communication was established with Athens, Rome and Paris. Several months later the Ministry of War constructed a new station of about 20 kw. (100 cycles), which only worked over small distances because shortly afterwards a 150 kw. station, system S.F.R. spark 1,000 cycles, with a horizontal antenna supported by eight towers 325 ft. high was erected at Herastreu (Bucharest). At the same station there existed an S.F.R. installation of 15 kw. These two S.F.R. stations afforded excellent wireless communication until the evacuation of Bucharest in November, 1916, when the 15 kw. station was installed at Vaslui (Moldavia), where it is still located—and established communication with Salonica and the 150 kw. station at Botosani (North Moldavia), where it worked until the evacuation of the latter town (June, 1917). The principal station at Herastreu (Bucharest), which was destroyed during enemy occupation, is being rebuilt. The eight metal towers, which were carried off by the Armies of Occupation, are being replaced by eight others about 365 ft. high, of which seven are ready. Whilst awaiting the proximate reinstallation of the 150 kw. station, a new 15 kw. station has been constructed on the spark system (600 cycles). The installation will soon be completed by a 50 kw. arc set, and will be fitted for automatic transmission and reception.

The whole system of radio communication is at present undergoing complete reorganisation, and it is hoped that by the beginning of this summer will be established and working.

A comprehensive system of public correspondence, meteorological, press

and time signals is being drawn up and will be put into operation as soon as the new stations under construction are completed.

ADMINISTRATION.

Roumania took part in the various International Radiotelegraphic Conferences.

An entirely new set of Laws and Regulations concerning radiotelegraphy and radiotelephony are being drawn up and will shortly be passed, and it is hoped to include them in the next edition.

RUSSIA

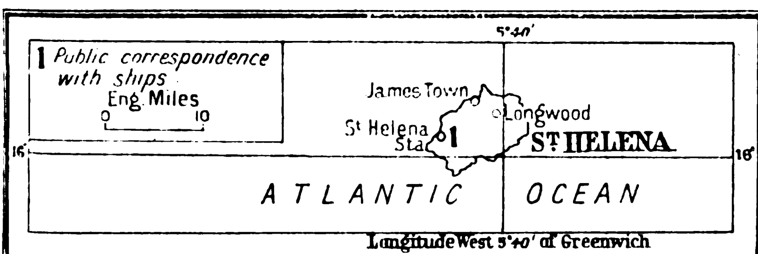
UNTIL March, 1917, this vast area was administered by the late ex-Czar Nicholas II, who was descended, in the female line, from Michael Romanoff, elected Czar in 1613 after the extinction of the House of Rurik. At the date above referred to, the Russian Duma carried through a *coup d'état*, as a result of which Czar Nicholas abdicated.

ADMINISTRATION.

Wireless telegraphy is very extensively used throughout these wide territories; but we are not at present in a position to give any information regarding Laws and Regulations. Reference to the 1921 edition of the Year-Book will give such Statutes and Regulations as were in existence prior to the *coup de état* mentioned above.

SAINT HELENA

THIS lonely little island, with an area forty-seven square miles, in the South Atlantic, lies about 800 miles from the nearest land (Ascension Island) and 1,200 miles from the West Coast of Africa. Its claim to fame rests upon the fact that it formed the place of exile of the great Napoleon.



St. Helena is an Admiralty coaling station and a resting place for the Eastern Telegraph Company's cable between Cape Town and St. Vincent (Cape de Verdes).

ADMINISTRATION.

Wireless Telegraphy is administered under the following Ordinance and Regulations :—

A—Wireless Telegraphy Ordinance, No. 2 of 1913.

B—Regulations.

IN THE FOURTH YEAR OF THE REIGN OF HIS MAJESTY KING GEORGE V.

MAJOR HARRY EDWARD SPILLER CORDEAUX, Companion of the Most Honourable Order of the Bath; Companion of the Most Distinguished Order of Saint Michael and Saint George; Governor and Commander-in-Chief. 14th July, 1913.

A An Ordinance to provide for the regulation of wireless telegraphy.

Be it enacted by the Governor of St. Helena as follows :—

I. This Ordinance may be cited as the "Wireless Telegraphy Ordinance, 1913."

II. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

III. A person shall not establish any wireless telegraphy station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

2. Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

IV. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

V. The Governor in Council may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the Gazette have the same effect as if enacted in this Ordinance.

2. The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

3. If at any time, in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

VI. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place, or on board any merchant ship without a license in that behalf, or contrary to the provisions of any regulations made under this Ordinance, or of any license granted under this Ordinance, he may grant a search warrant to any police officer or any person appointed in that behalf by the chief of police and named in the warrant and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place, or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

VII. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding £50, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

2. Proceedings shall be taken before the police magistrate on the complaint of the chief of police or of any other person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

VIII. "The Wireless Telegraphy Ordinance, 1912," is hereby repealed.

GOD SAVE THE KING!

Given under the Public Seal of the Island of St. Helena this 14th day of July, 1913.

By command of His Excellency the Governor,

(Signed) A. Hands,
Chief Clerk.

REGULATIONS.

Made by the Govenor in Council under Ordinance No. 2 of 1913, entitled "An Ordinance to provide for the Regulation of Wireless Telegraphy."

I. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(a) Naval signalling, or

(b) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

II. In these Regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

III. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

IV. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

V. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

VI. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made by the Governor in Council this 14th day of July, 1913.

(Signed) A. Hands,
Chief Clerk.

SAINT KITTS-NEVIS

(See Leeward Islands.)

SAINT LUCIA

(See map on p. 376.)

ST. LUCIA, lying 30 miles north-east of St. Vincent, possesses a total area of 233 square miles. One of the most notable features consists of a twin natural phenomenon known as the Pitons, great conical mountains, which lie at the mouth of Soufrière Bay. Castries, the capital, is on the western coast, near its northern extremity.

CONTROL AND ORGANISATION.

The wireless station, situated on the Morne Fortune overlooking the capital, was erected by the Admiralty in 1915, and is maintained and controlled by that Department. The officer in charge is a naval petty officer telegraphist and the operators are naval ratings.

ADMINISTRATION.

Wireless telegraphy is administered under an Ordinance of 1912 and various Regulations issued on its authority.

A—Wireless Telegraphy Ordinance, 1912.
B—Regulations of November 25th, 1912.
C—Regulations of August 24th, 1914.
D—Regulations affecting Ship Stations, June 9th, 1917.

WIRELESS TELEGRAPHY ORDINANCE.
No. 10 of 1912.

A This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1912.

2. In this Ordinance "wireless telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (*a*) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(*b*) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or Foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

5. (*a*) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(*b*) The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(*c*) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under this Ordinance he may grant a search warrant to any police officer or any person appointed in that behalf by the Chief of Police and named in the warrant, and a warrant so granted shall authorise the police officer or person named therein to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (*a*) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(*b*) Proceedings shall be taken before the First District Court on the complaint of the Chief of Police or of any person thereto authorised by him in writing, and the procedure shall be the same as the procedure for the time being in force in respect of offences punishable on summary conviction.

8. The Wireless Telegraph Ordinance, 1903, is hereby repealed.

SCHEDULE—SECTION 5 (2).

REGULATIONS PASSED NOVEMBER 25TH, 1912.

B

All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with—

(*a*) Naval signalling, or

(*b*) The working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof; and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these regulations "naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedngs under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in charge or command of the ship.

6. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

REGULATIONS PASSED AUGUST 24TH, 1914.

C

Whereas by Section 5 (3) of the Wireless Telegraphy Ordinance, 1912, it is enacted that if at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time; and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

And whereas, in my opinion, such emergency as aforesaid has arisen :—

Now I (the Acting Administrator) do hereby make the following further Regulations namely :—

1. The Governor may appoint any person to take possession and control of the apparatus for wireless telegraphy on board of any merchant ship while in the territorial waters of the Colony.

2. Any person so appointed may enter upon any such ship and take possession of the aforesaid apparatus thereon on behalf of His Majesty, and use the same for His Majesty's Service, and subject thereto for such ordinary services as to the said person may seem fit.

3. Any such person may instead of taking possession of such apparatus as aforesaid direct the master of the ship to submit or cause to be submitted to him all messages intended for transmission or arriving by the said apparatus or any class or classes of such messages, to stop or delay the transmission of any messages or deliver the same to him, and generally to obey all such directions with reference to the transmission of messages as such person may prescribe and the master of the ship shall obey and conform to all such directions. Any master failing to obey and conform to any such direction shall be liable on summary conviction to the penalties provided under the Ordinance.

REGULATIONS MADE BY THE GOVERNOR.

OPERATION OF SHIP STATIONS WITHIN THE TERRITORIAL WATERS OF THE COLONY.

June 9th, 1917.

D

1. The radiotelegraph stations on board ships (other than His Majesty's ships of war or ships of war of his Allies) shall not be worked whilst such ships are within the territorial waters of the Colony.

2. For the proper enforcement of the above ships of British register in the territorial waters of the Colony must completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging in such a manner as to show they are properly disconnected.

3. Ships of foreign register in the territorial waters of the Colony must—subject to the provisions of the following Regulation 4—take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus.

4. Ships of foreign register remaining in the territorial waters of the Colony for less than twelve hours may, at the discretion of the competent naval authority, or the person appointed by the Governor for the purpose, be permitted to leave their aerials up, provided the same are disconnected in accordance with the provisions of Regulation 2 of these regulations.

SAINT VINCENT (B.W.I.)

ST. VINCENT, lying 30 miles south-west of St. Lucia and 97 miles west of Barbados, comprises an area of 140 square miles.

ADMINISTRATION.

No wireless stations exist in this Colony, but wireless telegraphy would be administered under an Ordinance and Regulations which figure below.

A—Wireless Telegraphy Ordinance, 1913.

B—Regulations.

ORDINANCE.

A This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1913."

2. In this Ordinance "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. (1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony except under and in accordance with a licence granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions, and restrictions on and subject to which it is granted.

4. A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony otherwise than in accordance with regulations under this Ordinance.

5. (1) The Governor in Council may from time to time make regulations for carrying into effect the purposes of this Ordinance, and such regulations shall on publication in the *Gazette* have the same effect as if enacted in this Ordinance.

(2) The Regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance, or of any license granted under this Ordinance, he may grant a search warrant to any Police Officer or any person appointed in that behalf by the Chief of Police and named in the warrant, and a warrant so granted shall authorise the Police Officer or person named therein to enter and inspect the station, place, or ship, and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

7. (1) Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

(2) Proceedings shall be taken before the Police Magistrate of the First District on the complaint of the Chief of Police or of any person thereto authorised by him in writing, and the procedure shal be the same as the procedure for the time be.. g in force in respect of offences punishable on summary conviction.

8. "The Wireless Telegraph Ordinance, 1904," and "The Wireless Telegraph Amendment Ordinance, 1912," are hereby repealed.

REGULATIONS.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with—

(*a*) Naval signalling, or

(*b*) the working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations "Naval Signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and Naval Stations, or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these Regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. Regulations made by the Governor in Council on the 17th day of December, 1912, under the authority of the Wireless Telegraphy Ordinances, 1904 and 1912 are hereby repealed

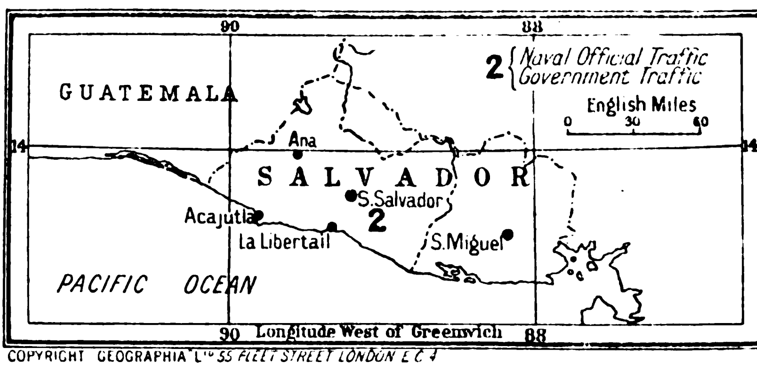
SALVADOR

THE independent Republic of El Salvador is situated on the West Coast of Central America, and occupies an area estimated at 9,500 square miles. The population, according to the Census of 1919, numbers 1,336,442. It originated in the course of the dissolution of the Central American Federation (Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica) which took place in 1839.

The form of Government is Republican, democratic and representative, and there are three branches of Administration: (1) The Executive, which comprises the President and Cabinet Ministers; (2) the Legislature or National Assembly; and (3) the Judiciary.

CONTROL AND ORGANISATION.

The only wireless station was erected by the Government and inaugurated in September, 1917. It is situated at the southern end of the city of San Salvador, near the military post "El Zapote." The station is open to public correspondence with ships. The station was presented to this Government by the Government of Mexico, and is known by the name of "Estación Venustiano Carranza."



Las Lomas de Candeleria open for official correspondence (N of Acajutla).

Radiotelegraphy is a State monoply and is under the control of the Telegraph and Telephone Administration, which forms one of the departments of the "Ministerio de Gobernacion y Fomento." Private companies or individuals are permitted under license from the Government to erect and work wireless telegraph and telephone stations provided the present contract with the Cable Company is not infringed.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Señor Dr. Baltasar Estupinián..	Minister of Public Works	San Salvador
Señor Don Ricardo Posada ..	Director of Telegraphs	San Salvador

ADMINISTRATION.

At present there are no special laws regulating wireless telegraphy, and the only publication which deals with this subject is the *Revista Telegrafica*, the official organ issued by the Director-General of Posts and Telegraphs, wherein are reported any such notices and items.

SAMOA ISLANDS

(See map on p. 424.)

SANDWICH ISLANDS

(See UNITED STATES OF AMERICA.)

SANTO DOMINGO (DOMINICAN REPUBLIC)

THE island of Santo Domingo is divided between two States, the Western being the Republic of Haiti, the Eastern the Republic of Santo Domingo. French is the official language of the former, Spanish of the latter. The first constitution of the Dominican Republic bears the date of November 18th, 1844; it has been amended several times, and the one in force at present bears the date of February 22nd, 1908. The President administers the Executive, the Legislative functions devolving on a National Congress with two Chambers, the Senate and Cámara de Diputados (House of Deputies). The United States landed troops in May, 1916, and is supervising the administration for the present. The Republic covers an area of 50,000 square kilometres, and is divided into twelve provinces. The population is calculated at 884,761 inhabitants.

CONTROL.

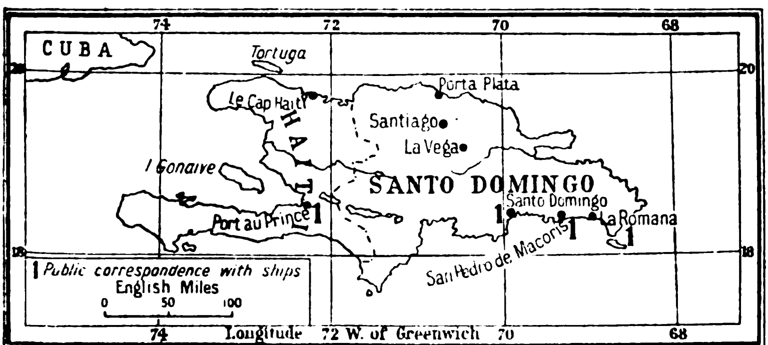
The supervision of the wireless service is under the control of the Superintendent of Posts and Telegraphs, who, in turn, is subordinate to the Director-General of Posts and Telegraphs, under the Department of "Fomento y Communicaciones."

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Lieut.-Comdr. R. M. Warfield, C.E.C., U.S. Navy	Officer in Charge of the Department of "Fomento y Comunicaciones"	Government Palace, Santo Domingo City
Mr. E. H. Hathaway	Director-General of Posts and Telegraphs	Senate Building, Santo Domingo City
Dr. Eduardo R. Soler, C.E.	Superintendent of Telegraphs	Santo Domingo City
Mr. W. H Reiksick	Electrical Gunner, U.S.N.	Wireless Telegraph, Santo Domingo City

ORGANISATION.

The first land wireless station was erected at the capital city of Santo Domingo in 1908. The apparatus, supplied by the de Forest Company of



San Pedro de Macoris closed.

New York, did not work satisfactorily, and despite the using of a power of 20 kw., only established irregular communication with Puerto Rico. After a lapse of five years, a 2-kw. set was installed in September, 1913, and regular public communication was instituted with Puerto Rico. In addition to this publicly owned station, there is a station at La Romana (in the Province of Seybo), owned by the (Sugar Refining) Central Guanica Company in Puerto Rico. The latter relays to the British Cable Company in Puerto Rico, and thus touch is maintained with the outside world.

In March, 1919, the two kilowatt set in the Radio Station of Santo Domingo was replaced by a new set, which includes one Radio Transmitter "Marconi System," of 5 kilowatts, 500 cycles, of 250 volts, alternating current.

Communication can now be made direct with San Juan, Puerto Rico, without the intervention of the Ensenada Station. The transmission of messages *via* Ensenada is now assured by day as well as by night, excepting when there are electric disturbances. It is also possible to have direct communication with Guantanamo, Cuba, especially at night, and with Port-au-Prince, Haiti.

Two steel towers, each 225 feet high, have been erected for the antennæ, which are 500 feet in length.

There are no public aviation, meteorological or press services, but there is an extensive storm warning service. The United States air station sends a daily weather report to Washington.

There are no direction finding stations.

ADMINISTRATION.

There are no special Laws and Regulations relating to wireless telegraphy and telephony.

A public contract is in force with the Central Guanica and Central Romana (Sugar Refining) Companies, dated December 19th, 1913. This lays down the conditions under which the two companies conduct for the Dominican Government Public Radiotelegraphic Service through the medium of their stations.

Clause I deals with the rates per word for foreign messages, which for the general public amounts to 30 cents per word.

Clause II deals with radio rates in the island—8 cents per word.

Clause III deals with special rates for officials of the States and the two companies, press rates, etc.

Clauses IV, V, and VI deal with matters and methods of accounting.

SARAWAK

(See Borneo, British.)

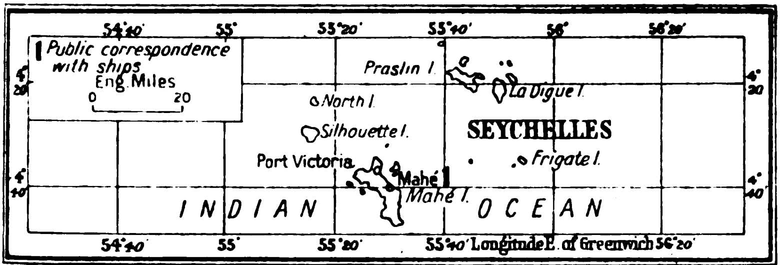
SEYCHELLES ISLANDS

THIS Colony consists of a group of islands belonging to Great Britain, almost in the middle of the Indian Ocean, and 600 miles north-east of Madagascar. Formally associated with Mauritius, the Colony of Seychelles was at one time administered from that island; but in 1888 a special Administrator was created, and the occupant of the post in 1903 was raised to the rank of Governor.

The principal island is Mahé (52½ square miles), and the Colony includes a number of dependent islands, which bring its total estimated area up to 156 square miles.

CONTROL AND ORGANISATION.

There are no private or commercial wireless installations. The only installation in the Colony was erected in 1915 at North-West Bay, Mahé, and belongs to the Admiralty.



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This station was closed for communication purposes on July 15th, 1921, but a " Care and Maintenance Party " has been left to keep the plant in running order.

There is no official of the Seychelles Government Service who is specially charged with the supervision of radiotelegraphy. Its control forms part of the general administration, of which the principal personnel will be found below.

Official.	*Title.*	*Address.*
Lieut.-Col. the Hon. Sir Eustace Fiennes, Bart.	Governor and Commander-in-Chief	Mahé
His Honour P. B. Petrides	Chief Justice	Mahé
Hon. J. L. Devaux	Legal Adviser and Crown Prosecutor	Mahé
Hon. E. Taylor	Treasurer and Collector of Customs	Mahé
Dr. J. B. Addison, O.B.E.	Chief Medical Officer	Mahé
Mr. G. S. Follows	Private Secretary	Mahé

ADMINISTRATION.

Radiotelegraphy is administered under the Ordinances, the text of which will be found below, and which cancel " The Telegraphic and Electrical Stations Ordinance, 1903," printed in our former issues.

The list of current rules here included is as follows :—

A—Ordinance No. 3 of 1914.
B—Ordinance No. 11 of 1917.
C—Regulations (No. 127) thereunder.

ORDINANCE No. 3 OF 1914.
Dated February 19th, 1914.

Enacted by the Governor of the Colony of Seychelles with the advice and consent of the Legislative Council thereof.

A To provide for the regulation of wireless telegraphy.

Be it enacted by the Governor of the Colony of Seychelles with the advice and consent of the Legislative Council thereof, as follows :—

1. This Ordinance may be cited as " The Wireless Telegraphy Ordinance, 1914."

2. In this Ordinance and in any regulation made thereunder the expression " Wireless Telegraphy " means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent and received : Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may whenever he shall deem it expedient to do so license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony.

4. (1) No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor in Executive Council may determine and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a license in that behalf or instals or works any apparatus for wireless telegraphy without a license in that

behalf he shall be liable to a fine not exceeding two thousand rupees (Rs. 2,000) or to imprisonment for a term not exceeding twelve months and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Ordinance without the previous sanction of the Crown Prosecutor.

(2) If the Chief Justice or the Police Magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within the jurisdiction without a license in that behalf he may grant a search warrant to any Police Officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Governor in Executive Council may make regulations for all or any of the following matters :—

(i) for prescribing the form and manner in which applications for license under this Ordinance are to be made;

(ii) for prescribing the fees payable on the grant of any license;

(iii) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship whether British or foreign in the waters of the Colony shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the waters thereof and so as to not interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) for prohibiting except with the special or general permission of the Postmaster of the Colony the working or using of any apparatus for wireless telegraphy on board a merchant ship whether British or foreign whilst such ship is in any of the harbours of the Colony;

(v) for prohibiting or regulating in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships whether British or foreign in the waters of the Colony the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraph (iii) (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the Governor that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy a license for that purpose shall be granted subject to such special terms, conditions and restrictions as the Governor may think proper but shall not be subject to any rent or royalty.

8. Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any regulations made thereunder or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Ordinance and for every such offence not otherwise specially provided for the offender shall in addition to the forfeiture of any articles seized be liable to a fine of one thousand Rupees (Rs. 1,000).

9. Ordinance No. 4 of 1903 is hereby repealed.

Ordinance No. 11 of 1917.

An Ordinance to Amend Ordinance No. 3 of 1914.

Dated September 1st, 1917.

Be it enacted by the Governor of the Colony of Seychelles by and with the advice and consent of the Legislative Council thereof, as follows :—

1. This Ordinance may be cited as "The Wireless Telegraph (Amendment) Ordinance, 1917," and shall be construed as one with the Wireless Telegraph Ordinance, 1914.

2. Section 6 (iv) of the Wireless Telegraphy Ordinance, 1914, is hereby repealed and replaced by the following :—

(iv) For prohibiting except with the general or special permission of the Governor, the working or using of any apparatus for wireless telegraphy on board any ship whether British or foreign other than His Majesty's ships of war, whilst such ship is in the waters of this Colony and for the control or disposal of any apparatus, instrument or thing which may be used in connection with wireless telegraphy on board any ship (other than His Majesty's ships of war) whilst such ship is in the waters of the Colony.

3. Section 6 (2) of the Wireless Telegraphy Ordinance, 1914, is hereby repealed.

4. (1) The Governor may appoint officers for the purpose of seeing that the provisions of the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, and any regulations made thereunder are complied with and it shall be lawful for such officers to go on board any ship whether British or foreign whilst any such ship is at anchor in the waters of the Colony to see that such provisions are complied with.

(2) If any such officer is molested, obstructed, hindered or insulted while in the execution of his duties an offence shall be deemed to have been committed.

5. For the purpose of any proceedings under the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, or under any regulations made thereunder, the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship and for any breach of the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, and any regulations made thereunder.

6. Any summons or other document in any proceedings under the Wireless Telegraphy Ordinance, 1914, as amended by this Ordinance, shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

7. The regulations published in *Gazette* No. 22 of 1914 under Government Notification No. 52 of 1914 are hereby repealed.

Passed in the Legislative Council at a meeting held on the 27th August, 1917.

REGULATIONS.

No. 127 of 1917.

1. The radiotelegraph stations on board ships (other than His Majesty's ships of war) shall not be worked whilst such ships are within any harbour or bay of the Colony.

2. For the proper enforcement of section 1 of these regulations ships of British register in any harbour or bay of the Colony must completely disconnect their aerial wires from their radio apparatus, the ends of such wires being suspended entirely clear of the radiotelegraph cabin, preferably from the main rigging, in such a manner as to show they are properly disconnected.

3. (1) Ships of foreign register in any harbour or bay of this Colony must, subject to the provisions of sub-section 2 of this section, take down their aerial wires completely and disconnect the same from their radiotelegraph apparatus.

(2) Ships of foreign register remaining in a harbour or bay of this Colony for less than twelve hours may, at the discretion of the Governor, be permitted to leave their aerials up, provided the same are disconnected in accordance with the provisions of section 2 of these regulations.

4. Any officer appointed under the provisions of section 4 of Ordinance No. 11 of 1917 may order that the radiotelegraph cabin on board any ship (other than His Majesty's ships of war) be sealed and he shall thereupon affix his seal to such cabin.

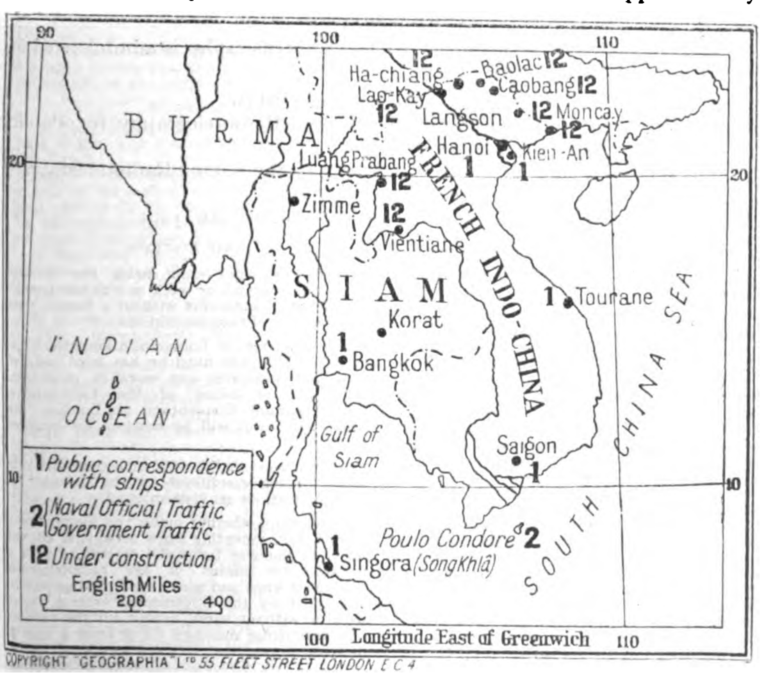
If any seal so affixed is removed or tampered with an offence shall be deemed to have been committed against these regulations.

Made by His Excellency the Governor in Executive Council at a meeting held on the 24th day of September, 1917.

SIAM.

THE Kingdom known to us as Siam, to the natives as Muang Thai, lies between British Burma and French Indo-China. Its integrity is guaranteed by France and Great Britain under mutual agreement. The form of government is an absolute monarchy, with an Executive Council of ministers.

The total area of Siam (inclusive of all the islands) measures about 240,000 English square miles. The coast line extends approximately



Tourane and Saigon also official correspondence.

over 2 000 miles, and geographically Siam lies between 5° 40′ and 20° 20′ N. latitude, and between 97° 5′ and 105° 0′ E. longitude. The greatest distance east to west is estimated at about 510 miles, and that from north to south 1,005 miles.

CONTROL.

Radiotelegraphy is organised in Siam under supervision of the Minister of Marine, but it is now controlled by the Ministry of Communications in so far as the public is concerned. The first stations erected were those at Saladeng in Bangkok (lat. 13° 44′ 32.49″ N., long. 100° 29′ 22.30″ E.), and at *Songkhlâ (lat. 7° 10′ 0″ N., long. 100° 36′ 12″ E.); both these land stations are directly controlled by Government.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Eng. Commander Phra Vidyu Duralikhit ..	Head and Chief Engineer of Radio-telegraphic Department	Wireless Station, Bangkok
Eng. Lieut.-Commander Lvang Jamnara-Aggikich	Assistant Engineer	Wireless Station, Bangkok
Lieut. Hatha Yuvanakara	Station Master	Bangkok
Eng. Junior Lieut. Chvam Kalantanandha	Operating Instructor	Bangkok
Sub.-Lieut. Cherm Chatiketa	Principal Assistant	Bangkok
Sub.-Lieut. Prasidhi Yangprida	Principal Assistant	Bangkok
Junior Lieut. Mee Pathamanavia	Station Master	Songkhla
Junior Lieut. Man Promphisuthi	Station Engineer	Songkhla

ORGANISATION.

There are experimental, amateur, and instructional stations at Saladeng. There are also ship stations on Government vessels.

ADMINISTRATION.

The law and regulations under which radiotelegraphy is administered in Siam will be found below.

A—Radiotelegraph Act, B. E. 2457 (1914).

B—Notice concerning the opening of Radiotelegraphy for Public Service, B. E. 2462 (1919).

C—Ministerial Regulations relating to the use of Radiotelegraphy, B. E. 2462 (1919).

D—Radiotelegraph Amendment Act August 4th, 1921.

RADIOTELEGRAPH LAW.

A This Law may be cited as "The Radiotelegraph Law, B.E. 2457" (1914).

2. It shall come into force from the date of its publication in the Government Gazette.

COAST AND LAND STATIONS.

3. The right to establish and work radio-stations for telegraphic and telephonic purposes on Siamese soil and on board ships permanently anchored in Siamese territorial waters is an exclusive privilege of the Government.

This privilege shall be reserved to the Department of Posts and Telegraphs in the Ministry of Communications.

4. The Army and Navy may establish and work independently radiotelegraph stations or field apparatus subject to such conditions as may be from time to time sanctioned in writing by the Minister of War or Marine.

Any station established under this section may be opened to public correspondence only under special arrangement with the Department of Posts and Telegraphs.

SHIP STATIONS.

5. No merchant ship under the Siamese flag shall establish or work any radiotelegraph or telephone apparatus without a license from the Minister of Communications.

The Minister of Communications shall not grant such license until he has been satisfied that the apparatus can work in accordance with the provisions of the International Radiotelegraph Convention of London, 5th July, 1912, and will be handled by qualified operators.

Such license shall be for such time and subject to such conditions as the Minister of Communications may deem good.

6. No ship, whether under the Siamese or a foreign flag, excepting ships of war, is allowed while in Siamese territorial waters to send a message by means of her radiotelegraph apparatus when and where such message can be forwarded by the Government system, either with or without wires, except for the purpose of transmitting messages to or from a ship in distress.

* Sometimes spelt "Singora."

SECRECY.

7. No person or persons engaged in or having knowledge of the operation of any radio-station shall disclose the contents of any message transmitted or received by such station for the purpose of transmission, except to the person to whom the same may be directed or his authorised agent, or to another station employed to forward such message to its destination, or in obedience to the directions of a Court of competent jurisdiction.

PENALTIES.

8. Whoever establishes or works any apparatus contrary to the provision of Sections 3 and 6, or in excess of the conditions laid down under Section 4 of this Law, shall be punished with imprisonment not exceeding six months or fine not exceeding five hundred ticals or both.

The captain or master of a ship, and the person directly responsible for the offence, if any, shall both be liable to punishment for every infringement of the provisions of Section 6.

9. Any person infringing Section 5 of this law shall be punished with fine not exceeding one hundred ticals.

10. Upon the conviction of any person of an offence under the foregoing sections, the Court may order the forfeiture of any apparatus used for the commission of such offence.

11. Any person injuring apparatus or committing any act of mischief to a radiotelegraph station lawfully established, or doing anything to prevent or intended to prevent the transmission or delivery of any radiotelegraph message by any such station, shall be guilty of an offence under Section 196 of the Penal Code.

12. Whoever commits any offence against Section 7 of this Law shall be punished under Section 279 to 281 of the Penal Code.

EXECUTION.

13. The Minister of Communications shall have charge and control of the execution of this Law.

It shall be lawful for him to frame regulations and to fix the scale of fees for land, coast, and ship charges in the transmission of messages by radiotelegraphy or telephony, as well as for licences under Section 5.

It shall also be lawful for him to frame regulations about the qualifications required from operators.

All such regulations shall be in accordance with the detailed Service Regulations appended to the International Radiotelegraph Convention.

Such regulations, on being sanctioned by His Majesty and published in the Government Gazette, shall be deemed to be part of this Law.

Given on the 24th day of April, B.E., 2457 (1914), being the 1,261st day of the Present Reign.

BY THE KING'S MOST EXCELLENT MAJESTY.

Whereas His Majesty's Government has always reserved to itself the exclusive right to establish and work means of telegraphic and telephonic communications throughout Siam;

And whereas apparatus for wireless telegraphy has now been devised practicable for use by land and sea;

And whereas it is desirable that ships under the Siamese flag, more specially passenger carriers, should be equipped with such apparatus, worked under proper regulations, for the greater safety of life at sea;

And whereas the regulations necessary to insure the proper and efficient working of wireless telegraphic stations must conform in all respects with the provisions of the International Radiotelegraph Convention of London, 1912, to which His Majesty's Government has been a party;

Therefore His Majesty has been pleased to enact the following law:—

NOTICE CONCERNING THE OPENING OF RADIOTELEGRAPHY FOR PUBLIC SERVICE.

Dated 22nd May, 1919.

By view of the progress made in commerce and trade in this country, it is considered that the use of Radiotelegraphy which was originally established by the Royal Government for its own use should be extended to general public.

The Ministry of Communications having submitted these facts before His Majesty the King, has now obtained the Royal Permission that the Naval Radiotelegraphic stations in Bangkok and at Singora (Songkhlâ) should be open to public use from the 1st June, 1919.

The public radiotelegraphic service will be under the management of the telegraph officials of the Post and Telegraph Department, who will receive and despatch radiotelegraphic telegrams in a similar manner to the despatch of other telegrams in the Kingdom.

Senders of radiotelegraphic messages should write clearly the words "Wireless Telegraph" on the upper left-hand corner of the form supplied, before the names of the persons for whom the messages are destined.

(Sd.) 1st Grand Councillor,
Chao Phya Wongsa Nuprabadh,
Minister of Communications.

MINISTERIAL REGULATIONS FOR THE LICENSING OF RADIOTELEGRAPHY UPON SHIPS, THE ISSUING OF CERTIFICATES OF COMPETENCY TO RADIOTELEGRAPH OPERATORS, THE FIXING OF FEES FOR SUCH LICENSES AND CERTIFICATES AND THE FIXING OF FEES FOR LAND, COAST AND SHIP CHARGES IN THE TRANSMISSION OF MESSAGES BY RADIOTELEGRAPHY.

C Whereas under Sections 5 and 13 of the Radiotelegraph Law, B. E. 2457, the Minister of Communications is empowered to license the establishment and working of radiotelegraph apparatus upon merchant ships under the Siamese Flag, to frame regulations about qualifications required from operators and to fix the scale of fees for land, coast and ship charges in the transmission of messages by radiotelegraphy, such Regulations, on being approved by His Majesty and published in the Government Gazette to be deemed to be part of the Law.

It has now pleased His Majesty the King to authorise the Minister of Communications to issue the following Ministerial Regulations:—

1. The operation of radiotelegraph stations upon any merchant ship under the Siamese Flag must conform to the provisions of the International Radiotelegraph Convention of London, July 5th, 1912, the detailed Service Regulations appended to the said International Radiotelegraph Convention, the Radiotelegraph Law, B. E. 2457 and any amendments and alterations which may be made therein, and the regulations from time to time issued by the Minister of Communications under the authority of said Radiotelegraph Law, B. E. 2457.

2. No person shall work the radiotelegraph upon any merchant ship within Siamese territorial waters in such a way as to interrupt or interfere with

(*a*) Naval or military signalling.

(*b*) The transmission of messages between other radiotelegraph stations lawfully established.

3. Before the installation of any radiotelegraph apparatus upon any merchant vessel under the Siamese Flag, an application shall first be filed with the Minister of Communications, according to Form A of Schedule I, attached hereto. If the Minister of Communications is satisfied that the apparatus described in said application, will, when installed, be capable of working in accordance with the requirements of Section 4 (*a*) of these Regulations, an installation licence will be issued according to Form B. of said Schedule I. When the installation is completed, the applicant shall notify the Minister of Communications, who, thereupon, will cause an inspection to be made. If this inspection is satisfactory, the Minister of Communications will issue a ship license according to Form C, and subject to the conditions therein contained. Such ship license shall be good until March 31st after its date, but may be renewed within one month immediately after the expiration of the period for which it was issued. Such installation licenses and ship licenses shall be executed in duplicate, one copy to be retained by the Ministry of Communications and the other given to the licensee.

4. The Minister of Communications shall not grant such ship license unless he is satisfied that—

(*a*) the radiotelegraph apparatus can be worked in accordance with the provisions of the International Radiotelegraph Convention of London and the detailed Service Regulations appended thereto, and that,

(*b*) operators qualified in accordance with the provisions of these Regulations and who are the holders of the certificates provided for herein will be employed to work the same.

5. A separate license is required for each ship belonging to the same owner.

6. The fee for the issuance of each ship license shall be 5 Bahts and a fee of the same amount shall be charged for each renewal thereof.

7. No person shall work a radiotelegraph on board any merchant ship under the Siamese Flag unless he holds either a first or second-class certificate of competency granted by the Minister of Communications.

8. The Minister of Communications shall grant certificates of competency in accordance with the conditions contained in the second Schedule to these Regulations.

9. Should a holder of a certificate of competency granted under these rules be proved to the satisfaction of the Minister of Communications wilfully or negligently to have failed to comply with the provisions of the International Radiotelegraph Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B. E. 2457 or the Regulations issued by the Minister of Communications, or any amendments or modifications of any of these or any other Regulations which may be issued from time to time for his guidance, the Minister of Communications may cancel the certificate.

10. The Minister of Communications or any officer authorised by him may require the holder of a certificate of competency to produce the same for cancellation under Regulation 9, and the holder must comply with such requisition.

11. Nothing in these Regulations shall apply to the use of the radiotelegraph for the purpose of making or answering signals of distress.

12. Rates for messages transmitted to or received from ship stations, shall be as follows :—

Coast station transmitting or receiving charge for radiotelegrams to or from ships, 20 satangs (0.40 francs) per word with a minimum charge of 2 Bahts (4.00 francs).

Land charges for the receipt or transmission of radiotelegrams over the Inland Telegraph System shall be those provided in the published tariff for inland messages. Land charges shall in addition include the actual expenses of postage or carriage, if the message is to be delivered outside of established telegraph districts.

Charges for relaying messages outside of Siam shall be fixed in accordance with published international tariffs.

These rates may be modified or supplemented and rates fixed for the charges at ship stations by the Minister of Communications.

SCHEDULE I.

Conditions and Forms of application for License to instal Radiotelegraph Apparatus on ships Installation License, and Ship License.

I.

Application for installation licenses shall be made according to the following form :—

FORM A.

Date......................

I,.........................of.........................the owner of the ship............ do hereby make application for permission to instal upon said ship apparatus for radiotelegraphy according to the following specification :

SPECIFICATION.

Name of Ship.	Normal range of Signalling in Nautical Miles		Character of Apparatus		Power			If Alternator is used, Number of Cycles per second
	by day	by night	Description of Receiving Appar'tus	Wave-length in Metres	Source and Maximum Output	Maximum taken by Transmitting Instruments. Current	Voltage	
1	2	3	4	5	6	7	8	9

The above described apparatus will be installed in..........months.

Signed......................

II.

License for installation of Radiotelegraph Apparatus upon ships shall be according to the following form :—

FORM B.

License for installing Radiotelegraph Apparatus.

Whereas.................of...............has filed with the Ministry of Communications his application dated...............for the installation of radiotelegraph apparatus upon the ship...............

Now the Minister of Communications does hereby license and permit the installation upon the said ship within the period of........months from date of radiotelegraph application in accordance with the following specification :

Name of Ship.	Normal range of Signalling in Nautical Miles.		Character of Apparatus		Power			If Alternator is used, Number of Cycles per second
	by day	by night	Description of Receiving Appar'tus	Wave-length in Metres	Source and Maximum Output	Maximum taken by transmitting Instruments. Current	Voltage	
1	2	3	4	5	6	7	8	9

This license and permission does not permit the licensee to operate said apparatus above described until after its inspection when installed and the issuance of a ship license.

Signed.........................
Minister of Communications.

III.

The ship license provided for in Regulation 3, shall be in the following form and subject to the following conditions :—

FORM C.

Know all men by these presents that, whereas..........of................hereafter called the "licensee," is desirous of establishing, maintaining and working on the ship.......... belonging to the licensee, radiotelegraphy under Section 5 of the Radiotelegraph Act, B. E. 2457 ;

And whereas the licensee has agreed and by the acceptance of this license, does become bound to operate and maintain the radiotelegraph installation for which this license is granted in accordance with the International Radiotelegraph Convention of London of July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B. E. 2457, and the Regulations thereunder by the Minister of Communications, and any and all amendments and modifications of any of these, which may be made from time to time ;

Now the Minister of Communications hereby grants to the licensee during the term or period commencing with the date hereof and terminating on the 31st day of March, B. E. 24....(19), licence and permission ;

(1) To establish, maintain and work for the purpose hereinafter mentioned upon the ship ....but subject in all respects to the provisions of said International Radiotelegraph Convention of London, July 5th, 1912, to the Service Regulations appended thereto, the Radiotelegraph Law of B. E. 2457, and the Regulations issued by the Minister of Communications, and all amendments and modifications of any of these, apparatus for radiotelegraphy known as the...........system of radiotelegraphy.

(2) To transmit and receive messages by means of the licensed apparatus between the said ship and coast stations and other ship stations ;

(3) To receive money or other valuable consideration for or in respect to the use of the licensed apparatus or for or in respect of the transmission or receipt of messages by means of the said apparatus, according to the schedule of charges fixed in the Regulations or by the Minister of Communications.

And it is hereby declared that the said license and permission is granted upon and subject to the following further conditions and provisions :—

(1) The licensed apparatus shall not be used by the licensee or by any other person either on behalf of or by permission of the licensee for the transmission or receipt of any messages except those authorised by this license.

(2) (*a*) The licensee shall not by the transmission of any message by means of the licensed apparatus or otherwise by the use of the licensed apparatus interfere with Naval or Military signalling or with any radiotelegraph station lawfully established.

(*b*) If at any time it becomes apparent that the working of the licensed apparatus upon said ship is inconsistent with the free use of naval or military signalling the licensee shall when required so to do by the Minister of Communications close said station upon said ship.

(3) The licensee shall comply with all such directions and observe all such rules and regulations as may be given or made by the Minister of Communications from time to time for the purpose of preventing interference with the working of any other radiotelegraph station and for enabling the messages exchanged by means of the licensed apparatus, to be distinguished from those emanating from any other radiotelegraph station.

(4) The licensee shall at all times indemnify His Majesty's Government, the Minister of Communications and the Department of Posts and Telegraphs against all actions, claims and demands which may be brought or made by any corporation, company or person in respect of

any damage arising from any act licensed or permitted by these presents.

(5) Subject to the provisions of this license, the licensee shall transmit messages by means of the licensed apparatus on equal terms without favour or precedence whether as regards rates of charge, order of transmission or otherwise, except that preference shall be given to messages transmitted on behalf of His Majesty or of His Majesty's Government.

(6) The licensee shall so far as possible receive from ships and light stations all requests for assistance and all signals of distress and shall answer such requests and signals and retransmit them with the least possible delay to the proper authorities by means of the licensed apparatus, or any other means in the power of the licensee.

(7) The licensed apparatus shall be worked only by a person holding a certificate of competency issued by the Minister of Communications.

(8) The licensee shall not divulge to any person other than properly authorised officials of His Majesty's Government or make any use whatever of any message coming to the knowledge of the licensee through naval or military signalling.

(9) The licensee shall keep such accounts records and registers of all messages transmitted by means of the licensed apparatus as the Minister of Communications may from time to time require and such accounts, records and registers shall be open to the inspections of the Minister of Communications or his duly authorised representative at all reasonable times.

(10) The Minister of Communications or his duly authorised representative may at all reasonable times enter upon said ship for the purpose of inspecting and may inspect any apparatus fixed or being in such ship for the purpose of sending and receiving messages by radiotelegraphy, and the method of working such apparatus.

(11) The Minister of Communications may at any time by notice in writing but without assigning any reason revoke and determine this license and thereupon this license shall determine and become absolutely void.

(12) Any notice, request or consent (whether required to be in writing or not) to be given by or on behalf of His Majesty's Government or by the Minister of Communications or the Director-General of the Post and Telegraph Department, may be served by sending the same in a letter addressed to the licensee at the office for the time being of the licensee, or by delivery to the master of the ship upon which the licensed apparatus is installed and any notice to be given by the licensee under these presents may be served by sending the same in registered letter addressed to the Minister of Communications.

Signed and delivered by................

Minister of Communications.

SCHEDULE II.

Conditions and Forms for the Granting of Certificates of Competency.

(1) Certificates of competency as to radiotelegraph operators on board merchant ships under the Siamese Flag, shall be granted by the Minister of Communications, subject to an examination and shall be in accordance with Form B. appended hereto. Such certificates shall indicate the system or systems of radiotelegraphy in which the examination was conducted, and shall certify that the holder:

(*a*) in the case of first-class certificates is able to send and receive, by sound, messages in plain language in the International Morse Code at a rate of not less than 20 words per minute (five letters being counted as one word); or

(*b*) in the case of second-class certificates is able to send and receive by sound, messages in plain language in the International Morse Code at a rate of from 12 to 19 words per minute (five letters being counted as one word); and

(*c*) is able to adjust the apparatus ordinarily used in some well-known system of radiotelegraphy so as to suit the varying conditions of working without using excessive transmitting power; and

(*d*) has an efficient working knowledge of the regulations applicable to the exchange of the radiotelegraphic traffic.

(2) Candidates for examination shall fill up an application according to Form A attached hereto, and submit the same to the Minister of Communications at Bangkok.

(3) Upon being notified that he has successfully passed the examination each candidate shall supply two photographs of himself, one of which will be attached to the certificate of competency, and the other to the duplicate of the certificate which is retained by the Minister of Communications. These photographs will be signed by the candidates and stamped by the issuing officers in such a way as to prevent substitution.

(4) A fee of 10 Bahts will be charged for each examination and an additional fee of 10 Bahts for the certificate issued to a successful applicant.

(5) Each certificate shall be good for five years and may be renewed at the expiration of that period for a like period of five years. Such renewal may be without re-examination if the applicant has been engaged in the actual transmission and receipt of radiotelegrams during at least three of the preceding five years. Otherwise an examination will be required. The fees for renewal examinations and the issuance of renewal certificates are the same as for the original examination and issuance.

(6) If the candidate satisfactorily passes the examination, he shall make a declaration that he will observe the secrecy of radiotelegrams which come to his knowledge in the course of duty.

FORM A.

Application for examination for a.......... class certificate of competency as a radiotelegrapher.

1. Name ....
2. Residence ....
3. Date and Place of Birth..........
4. Nationality -....................
5. System of radiotelegraph in which applicant wishes to be examined

....

The undersigned applicant for examination for a certificate of competency as a radiotelegrapher agrees that, if successful, he will observe all requirements, so far as they may apply to him, of the International Radio-Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law, B. E. 2457, the Regulations used in pursuance thereof, and all amendments and modifications of any of these, which may be issued from time to time.

(Signature)................

FORM B.

....CLASS CERTIFICATE OF COMPETENCY.

Whereas,................having been examined as to his competency as a radiotelegrapher, according to the Regulations in such case made and provided and said examination having been successfully passed.

It is hereby certified that..............is able to send and receive by sound messages in plain language in the International Morse Code at the rate of...........words per minute (five letters being counted as one word) and is able to adjust the apparatus ordinarily used in the................system of radiotelegraphy so as to suit varying conditions of working, without using excessive transmitting power and has an efficient working knowledge of the regulations applicable to the exchange of radiotelegraphic traffic.

Accordingly this........class certificate of competency has been issued to the said........ ....who by accepting it agrees to be bound, so far as they may apply to him, by all provisions of the International Radiotelegraphic Convention of London, July 5th, 1912, the detailed Service Regulations appended thereto, the Radiotelegraph Law B. E. 2457, and the Regulations issued under the authority thereof, and any amendments and modifications of any of these which may be issued from time to time.

Signed and delivered by..............
Minister of Communications.

BACK.

Name ....
Residence ....
Date and Place of Birth ....
Nationality ....

I do hereby declare that I will observe the secrecy of radiotelegrams which come to my knowledge in the course of duty.

....

(Photograph.)

THE RADIOTELEGRAPH AMENDMENT ACT.

BY THE KING'S MOST EXCELLENT MAJESTY.

D Whereas the authority conferred upon the Minister of Communications by virtue of Article 13 of the Radiotelegraph Act B.E. 2457 is not sufficient to execute and control the Radiotelegraph service.

Therefore His Majesty has been pleased to further amend the Radiotelegraph Act B.E. 2457 as follows :—

(1) This Act shall be called the Radiotelegraph Amendment Act 2464.

(2) It shall come into force from the 4th day of August, 1921.

(3) In Chapter VI Article 13 after paragraph 3 of the Radiotelegraph Act B.E. 2457, the following paragraph shall be inserted, namely:

It shall also be lawful for him, whenever he deems expedient, to issue notifications granting temporary permission to ships to send and receive messages by means of their wireless apparatus while in Siamese territorial waters.

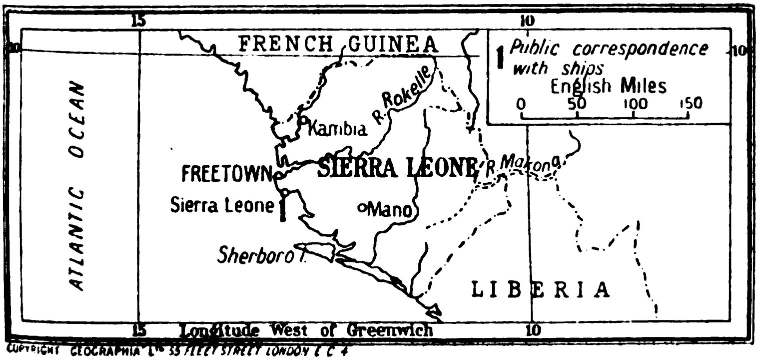
Given on the 4th day of August, 1921, being the twelfth year of the Present Reign.

SIBERIA

SIERRA LEONE

SIERRA LEONE proper consists of a peninsula about 26 miles long and 12 miles broad covering an area of about 300 square miles. The Colony, however, is much more extensive, stretching from French Guinea on the north to the Republic of Liberia on the east and south-east, its total area being 4,000 square miles.

The capital is Freetown, and the colonial administration is conducted by a Governor and Commander-in-Chief, assisted by Executive and Legislative Councils. The same officials also administer the "Protectorate," a term



which applies to the territories, not being portions of the Colony of Sierra Leone, lying between 6° and 10° north latitude and 10° and 14° of west longitude.

CONTROL.

A wireless telegraphy station is installed at Freetown, and is owned and controlled by the African Direct Telegraph Company. Mr. A. G. Fuller is the Superintendant in charge.

The regulation of wireless telegraphy rests solely in the hands of the Government. There are no wireless clubs or societies.

ADMINISTRATION.

The Sierre Leone wireless laws and regulations were first formulated in the Decree of 1903, and the Schedule founded thereon. In 1912 this Decree and the regulations in the Schedule were amended by Ordinance No. 19 with the Schedule which was thereto attached. In the following year (1913) these were in their turn replaced by Ordinance No. 11 with its accompanying Schedule, both of which we print below. A set of Regulations issued on July 16th, 1917, has been superseded by an additional set issued on May 12th. 1919, which will be found below.

The list of reprints included here covers :—

A—Ordinance No. 11 of 1913.
B—Schedule dated May 23rd, 1913.
C—Regulation No. 1 of 1919.

An Ordinance to Provide for the Regulation of Wireless Telegraphy.
No. 11 of 1913.

A Be it enacted by the Governor of the Colony of Sierra Leone, with the advice and consent of the Legislative Council thereof as follows :—

1. *Short Title.*—This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1913.

2. *Definition of "Wireless Telegraphy."*—In this Ordinance, "Wireless Telegraphy" means any system of communication by telegraph without the aid of any wire connecting the points from and at which the messages or other communications are sent or received: Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. *License for Wireless Telegraphy.*—(1) A person shall not establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place or on board any ship registered in the Colony, except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor may determine, and shall contain the terms, conditions and restrictions on and subject to which it is granted.

4. *Apparatus aboard ships to be worked in accordance with regulations.*—A person shall not work any apparatus for wireless telegraphy installed on any merchant ship, whether British or foreign, while that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations under this Ordinance.

5. *Regulations.*—(1) The Governor may from time to time make regulations for carrying into effect the purposes of this Ordinance.

(2) *Schedule.*—The regulations in the Schedule to this Ordinance shall have effect except in so far as they may be amended or rescinded by regulations made under the authority of this section.

(3) If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships while in the territorial waters of the Colony shall be subject to such further regulations as may be made by the Governor from time to time, and such regulations may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

6. *Search Warrant.*—If a Magistrate is satisfied by information on oath that there is reasonable ground for suspecting that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any merchant ship without a license in that behalf or contrary to the provisions of any regulations made under this Ordinance or of any license granted under this Ordinance, he may grant a search warrant to any superior Officer of Police named in the warrant, and a warrant so granted shall authorise the Officer to enter and inspect the station, place, or ship, and to seize any apparatus which appears to be used or intended to be used for wireless telegraphy therein.

7. *Penalties.*—Any person who shall offend against any provision of this Ordinance or any of the regulations made thereunder shall be liable on summary conviction for every such offence to a fine not exceeding fifty pounds, and upon such conviction the Court may order that any apparatus for wireless telegraphy in connection with which the offence was committed shall be seized and forfeited.

8. *Repeal No.* 22 of 1903, *No.* 19 of 1912.—The Wireless Telegraphy Ordinance, 1903, and the Wireless Telegraphy Amendment Ordinance 1912, are hereby repealed.

SCHEDULE—SECTION 5 (2).
REGULATIONS.

B 1. All apparatus for Wireless Telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with

(*a*) Naval signalling, or
(*b*) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. In these Regulations, "Naval signalling" means signalling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Naval Stations or between a ship of His Majesty's Navy or a Naval Station and any other wireless telegraph station whether on shore or on any ship.

3. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

4. For the purpose of any proceedings under these regulations the master or person being or appearing to be in command or charge of any ship shall be deemed to have authorised and to be responsible for the use or working of any apparatus on board such ship.

5. Any summons or other document in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

6. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Passed in the Legislative Council this twenty-third day of May in the year of our Lord, one thousand nine hundred and thirteen.

REGULATIONS (No. 1 OF 1919) MADE UNDER SUB-SECTION (1) OF SECTION 5 OF THE WIRELESS TELEGRAPHY ORDINANCE, 1913 (No. 11 OF 1913).

C Whereas by sub-section (1) of section 5 of the Wireless Telegraphy Ordinance, 1913 (No. 11 of 1913), it is provided that the Governor may from time to time make regulations for carrying into effect the purposes of the Ordinance:

And whereas by sub-section (2) of section 5 it is provided that the regulations made and passed by the Legislative Council, 23rd day of May, 1913, shall have effect except in so far as they shall be amended or rescinded by regulations made under the authority of the section:

And whereas by regulations made the 16th day of July, 1917, certain of the above recited regulations were rescinded and other regulations were substituted therefor:

And whereas I am minded to make other provision in lieu of the last above recited regulations:

Now, therefore, under and by virtue of the power and authority in that behalf vested in me it is ordered that the regulations made the 16th day of July, 1917, are hereby rescinded and the following substituted therefor:—

1. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used while such ship is in any harbour or bay of the Colony except with the special or general permission of the Governor.

2. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Made this 12th day of May, 1919.

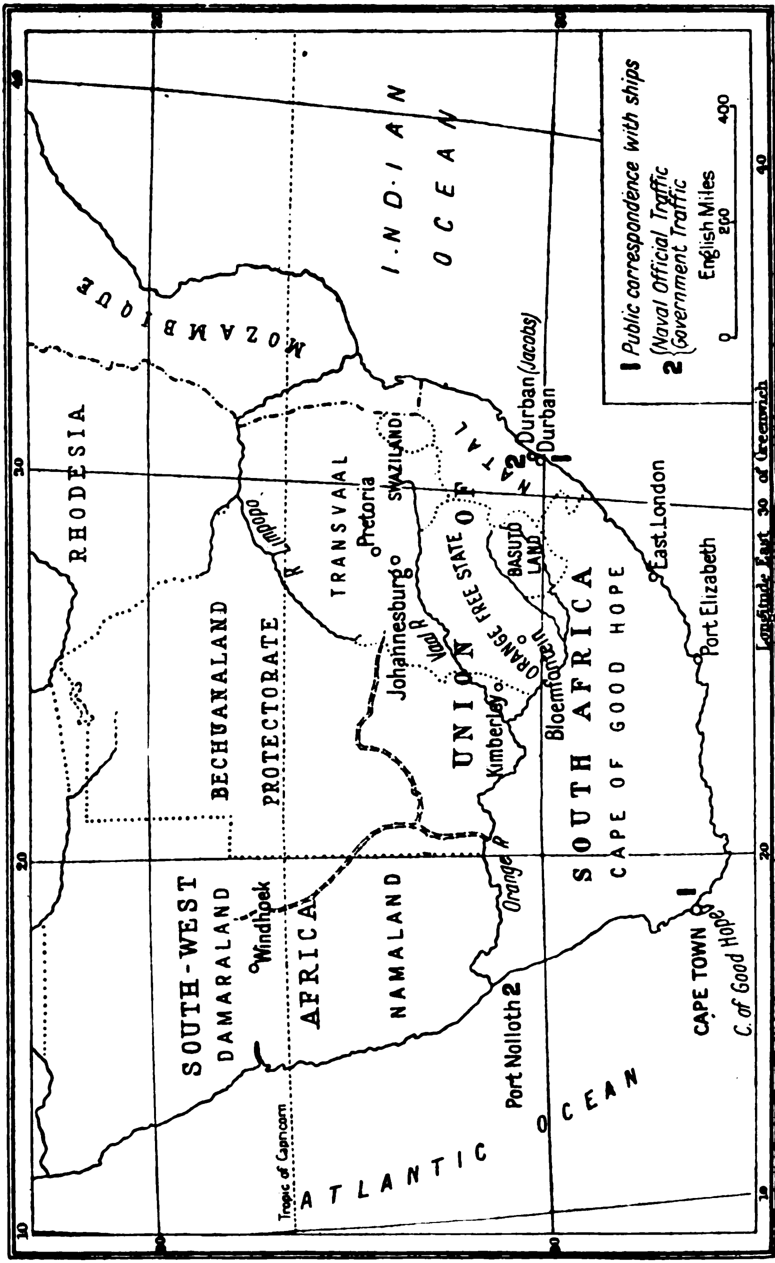
SOLOMON ISLANDS

(See map on p. 424.)

SOUTH AFRICA (UNION OF)

THE Union of South Africa lies between 22° and 34° 50′ south latitude and 16° 30′ and 32° 40′ east longitude. Its total superficial area, not including the Protectorates of Bechuanaland, Basutoland, and Swaziland, which are included within the same geographical boundaries, but do not form part of the Union, is 473,075 square miles. The coast line extends from the mouth of the Orange River on the west coast to a point in latitude south 26° 30′ on the east coast, and measures about 1,725 miles. The greatest distance east to west is a little under 900 miles, and north to south a little over 1,800 miles. At the last complete census, taken in 1911, the population was 1,276,242 Europeans, 4,019,006 natives, and 678,146 other coloured races. On May 5th, 1918, a census of the European population was taken. The preliminary unaudited result of the census shows that there were 730,179 males and 694,511 females, exclusive of persons absent on active service or work in connection with the war. The Union was constituted on May 31st, 1910, under the South Africa Act of 1909, and embraces the former separate self-governing colonies of the Cape of Good Hope, the Transvaal, the Orange Free State, and Natal.

The Executive Government is vested in a Governor-General appointed by the Crown, aided by an Executive Council of Union Ministers, with two Houses of Legislature.



Port Nolloth and Durban (Jacobs) now closed. Port Elizabeth open for public general correspondence.

CONTROL.

The administration of radiotelegraphy is in the hands of the Postmaster-General. It is directed by the Engineer-in-Chief of Posts and Telegraphs, and is not treated as a separate unit.

For Colonies working under the direction of the High Commissioner of South Africa (e.g., *Basutoland, etc.*)*—see under their own names.*

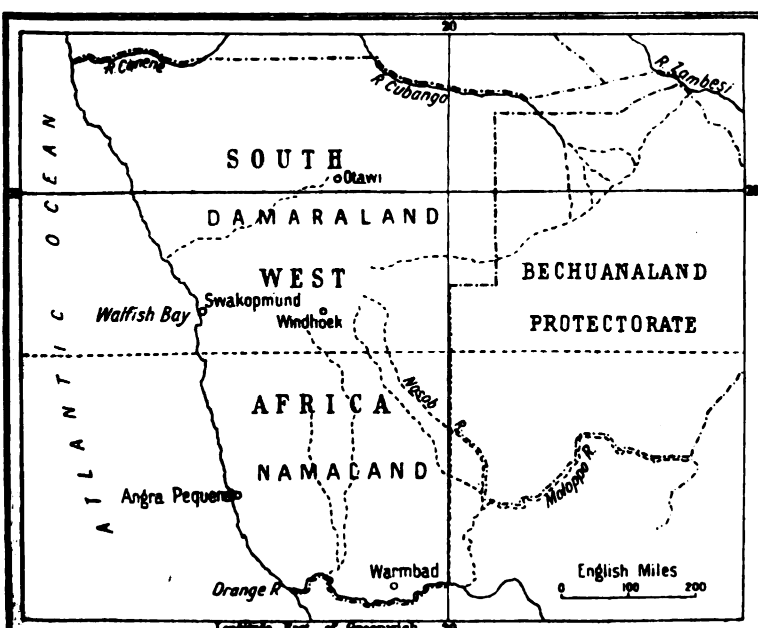
OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. H. W. S. Twycross	Postmaster-General	Pretoria
Major E. A. Sturman, C.B.E.	Secretary to the General Post Office	Pretoria
Lt.-Col. N. Harrison, C.M.G., D.S.O., M.I.E.E.	Engineer-in-Chief	Pretoria
Mr. J. H. Weaver, C.B.E.	General Traffic Superintendent of Telegraphs	Pretoria

ORGANISATION.

There are three wireless stations in South Africa, under the control of the Union Government. The first was established at Durban in June, 1910, another at Slangkop, near Cape Town, in May, 1911, and a third at Port Elizabeth, in April, 1921. In September, 1913, it became necessary in connection with the port defences to remove the Durban station from the position where it had been originally erected to a point some four miles distant. The change of situation has not adversely affected its efficiency.

There are no privately owned stations, and in regard to private experimental wireless stations, licenses are only issued in very exceptional circumstances.



The latest available statistics are as follows :—

Land stations for public service to ships	..	3
Ship stations on privately owned vessels	..	2 (low power)
Ship stations on railway owned vessels	..	3 (low power)

ADMINISTRATION.

The only statutory regulation on radiotelegraphy within the Union is that contained in the preamble to the Post Office Act, and Section 80 *ibid.*, both of which will be found below.

No licenses in terms of the section of the P.O. Act of 1911 are being issued under present conditions, and there are no private licensees for radiotelegraphy in existence except four in respect of certain ships. The license follows the same lines as that issued in Great Britain.

There is no Union Act compelling ships trading in South African waters to be fitted with radiotelegraphic apparatus.

A—Statutory Regulation (Preamble to P.O. Act, 1911).
B—Section 80 of Post Office Act, 1911.
C—Conditions of issue of Amateur License.

POST OFFICE ADMINISTRATION AND SHIPPING COMBINATION DISCOURAGEMENT ACT, 1911.

CHAPTER V.—SECTION 1.

A In this Act, unless inconsistent with the context, "telegraph" shall include "telephone," and shall mean any system or means of conveying signs, signals, sounds, or communications, by the agency of electricity, magnetism, electro-magnetism, or by any agency of a like nature, whether with or without the aid of wires, and shall include the system commonly known as wireless telegraphy, or ætheric signalling, and any improvements or developments of that system.

"Telegraph line" shall include any apparatus, instrument, pole, mast, standard, wire, pipe, tunnel, pneumatic or other tube, thing, or means whatever, which is or may be used in connection with or for the purpose of sending, transmitting, conveying, or receiving telegraphic signs, signals, sounds, or communications.

1. The Postmaster-General shall have the exclusive privilege of constructing and maintaining telegraph lines and of transmitting telegrams or other communications by telegraph within the Union or the territorial waters thereof and of performing all the incidental services of receiving, collecting, or delivering telegrams or other such communications: Provided that—

(*a*) the owners of any system of railways may maintain and work for the purposes of any such railway, for the time and to the extent authorised by any law, any telegraph lines constructed in pursuance of rights conferred by that law; and

(*b*) the Postmaster-General may construct, maintain, or lease telegraph lines for private use or may, by license, authorise any person to construct, maintain, and work private telegraph lines within the Union or its territorial waters and may prescribe the fees and conditions therefor.

POST OFFICE ADMINISTRATION ACT, 1911.

B 80. (1) The Postmaster-General shall have the exclusive privilege of constructing and maintaining telegraph lines and of transmitting telegrams or other communications by telegraph within the Union or the territorial waters thereof and of performing all the incidental services of receiving, collecting, or delivering telegrams or other such communications: Provided that—

(*a*) the owners of any system of railways may maintain and work for the purpose of any such railway, for the time and to the extent authorised by any law, any telegraph lines constructed in pursuance of rights conferred by that law; and

(*b*) the Postmaster-General may construct, maintain or lease telegraph lines for private use or may, by license, authorise any person to construct, maintain, and work private telegraph lines within the Union or its territorial waters and may prescribe the fees and conditions therefor.

(2) No telegraph line shall be used for the purpose of transmitting or delivering telegrams for the public except by the authority of the Postmaster-General and upon such terms and conditions as he may prescribe, and the department shall have the right, by means of its officers, of inspecting all offices which are authorised to accept, transmit, or deliver public telegrams.

CONDITIONS OF ISSUE OF AMATEUR LICENSE.

PROCEDURE TO BE FOLLOWED.

C The applicant should furnish :—

1. Evidence of his British nationality and two written references by persons of standing, who are British subjects and not related to the applicant.

2. His full Christian names and particulars of his occupation.

N.B—If the applicant is a minor, the authority to use wireless apparatus can only be issued in the name of his parent or guardian, who should comply with the requirements and state his (or her) full address and relationship (if any) to the applicant. There is no objection to a minor working the authorised apparatus as the agent of his parent or guardian.

3. A remittance of 10s.

4. A description of the apparatus which it is proposed to instal and, if authority is desired for the use of thermionic valves, a diagram of the circuits in which they would be used.

5. A sketch showing the form, height and dimensions of the proposed aerial (including leading-in wires).

N.B.—Extreme height of aerial above ground 100ft. Total length of wire including leading-in wires.

100 feet for single wire aerial.

140 feet of wire where two or more wires are used, *e.g.*, total length of 70 feet of double wire.

6. The address at which the apparatus would be installed.

7. Satisfactory evidence that he has in view some definite object of scientific value or genera public utility. If scientific research is intended he should be certified as a competent investigator by a Government Department or some recognised scientific body.

8. The name of the person or persons with whose wireless installation it is proposed to communicate, communications beyond a radius of ten miles being forbidden.

9. The installation shall be subject to the approval of the Postmaster-General and to inspection by any of his officers from time to time.

SPAIN

THE present Constitution of Spain after having been drawn up by the Government and laid before a *Cortes Constituyentes* elected for its ratification, on March 27th, 1876, was proclaimed on June 30th of that year. It enacts that Spain shall be a Constitutional Monarchy, the Executive vested in the King, and the power to make laws " in the Cortes with the King." The reigning monarch, Alphonso XIII, belongs to the House of Bourbon, which succeeded to the Spanish throne at the end of the seventeenth century. He married Princess Victoria Eugenie, granddaughter of the late Queen Victoria, on May 31st, 1906.

The territory included under the Spanish administration comprises 49 provinces, 47 in the Iberian peninsula and 2 provinces, namely, Canary and Balearic Islands, and as colonies, Fernando Po Island, the Muni coast and Rio de Oro, and Ceuta and Melilla, in Morocco.

The superficial area of the 47 provinces in the Peninsula is 493,019 sq. km., the area of the Canaries is 7,272.60 sq. km., and the area of Balearic Islands 5,014 sq. km.

CONTROL.

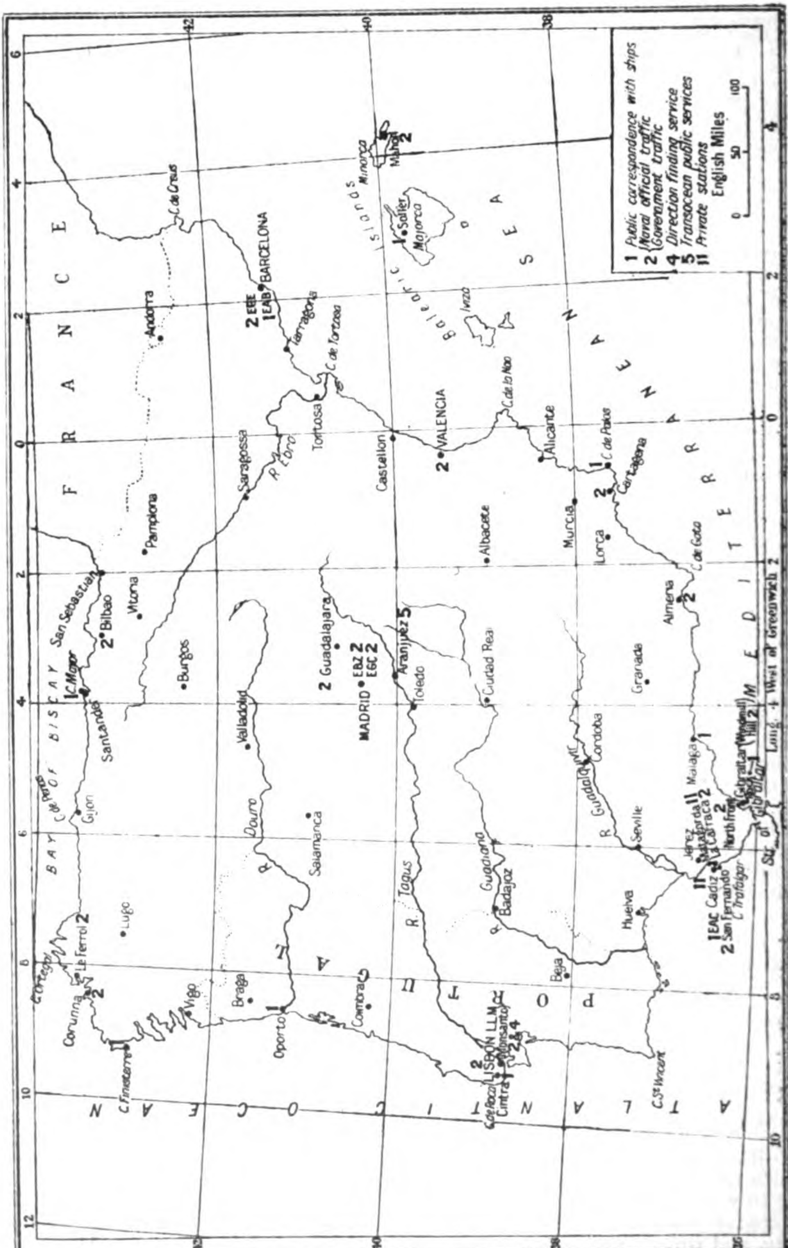
Radiotelegraphy in Spain is a State monopoly, under the control of the Home Office and the Ministry of War and the Navy. The establishment of a wireless public service was granted on June 26th, 1908, to " La Sociedad Española Oerlikon," which was responsible for the erection of 24 land stations having three different ranges. The " Sociedad Española Oerlikon " then formed a company " Compañia Concesionaria del servicio público español de Telegrafia sin hilos," which erected the Cadiz, Tenerife, and Las Palmas stations, but did not complete them. The time granted in the contract having elapsed, the concession was then transferred to the actual holders of it, " La Compañia Nacional de Telegrafia sin Hilos," which was formed with the aid, and under the direction of Marconi's Wireless Telegraph Company, Limited, and at the suggestion of the latter, the original plan was altered and reduced to 10 stations, all of greater range.

Licenses for erecting and working wireless stations by private companies are not granted, except in the case of teaching or meteorological receiving stations. According to the latest statistics the following stations exist :—

Meteorological observatories	4
Official seismological stations	4
Educational stations	7
Stations open for public service to ships	8
Stations open for Government traffic only	13
Stations open for private traffic	2

There are no *experimental* stations and no *amateur* stations.

There is no special form of license, and the general conditions subject to which these licenses are granted can be found in the addition to Article 6 of the Royal Decree of January 24th, 1908, which Article was modified by Royal Decree of July 19th; 1914 , also Article 6 of Royal Decree of February 8th, 1917, and Royal Decree of January, 1920.



New station opened at North Front (Gibraltar).

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
Excmo. Sr. Conde Coello de Portugal..	Home Minister	P. Prado 3
Excmo. Sr. D Juan Lacierva	War Minister	Alphonso XII 50
Excmo. Sr. Morgues Cotina	Navy Minister	Jorge Juan
Excmo. Sr. Condedo Colombi	Director-General of Posts and Telegraphs	Hotel Ritz
Sr. Don Tomas Aguilar	Sub-Director of Telegraphs ..	Imperial 2
Sr. Don Augusto Boyer	Head of Radio Service	Alcalá 133

The only company holding permission to work wireless for public service is the " Compañia Nacional de Telegrafia sin Hilos."

The companies engaged up to the present in erecting wireless stations are the following: La Compañia Nacional de Telegrafia sin Hilos (Marconi system), A.E.G. Thomson-Houston Ibérica (Telefunken), La Compañia Ibérica de Telecomunicación, Centro Electrotécnico (Army Department), and Military engineers (for military purposes).

ORGANISATION.

Radiotelegraphy has from its initiation in practice, attracted much attention and interest in the Iberian Peninsula.

As early as 1899 commissions were appointed in Spain which, from time to time, issued reports to their Government on the subject of Wireless Telegraphy. As a result, a Royal Decree of May 21st, 1905, appointed a permanent commission, presided over by the Chief of the General Staff and including representatives of the War Office, Admiralty and Home Office, thus anticipating the first International Conference concerning Wireless Telegraphy—*i.e.*, the one held in Berlin, 1906 (subsequently modified by the London International Convention of 1912).

Very little was actually done in regard to the erection of wireless telegraphic installations before 1906. Trials with unsatisfactory results had been carried out by the Army with field sets, and the Navy with stations on board the *Pelayo, Princesa de Asturias*, and *Giralda*. In regard to aviation, there is a project to instal several stations on the aerial line of Toulouse-Rabat. The station at Prat de Llobregat is already handling traffic for this line. At Alicante another station has been installed for meteorological service and aviation. The lines of Madrid-Larache and Cantabrico (Postal Aviation) is also to be equipped with several radiotelegraphic stations.

A commission is setting out to study the establishment of various stations on the coast of Spain for Radiogoneometric Service, but up to the present it has not determined the sites of these stations.

For the service of lighthouses two radiotelegraphic-telephonic stations have been installed at Castellon and Columbretes, and tenders have been invited for the equipment of various other lighthouses, amongst which are Cabos Villano and Finisterre.

ADMINISTRATION.

Spain is one of the signatories of the important " Safety of Life at Sea " Convention, and has become a party to all the international agreements affecting radiotelegraphy. She has, moreover, passed separate laws and regulations framed with the object of establishing and developing this applied science in the home country and in her dependencies.

In the course of 1917 an important Royal Order was published by the Ministry of Marine, enacting that every merchant vessel of 500 tons and over must instal wireless telegraphy. The text of this Order will be found below together with the following current Rules and Regulations.

A—Law of October 26th, 1907.
B—General Rules, January 24th, 1908.
C—Regulations, January 24th, 1908.
D—Royal Order of September 4th, 1914.
E—Royal Decree dated February 20th, 1917.
F—Royal Order of June 22nd, 1917.
G—Decree dated October 12th, 1917.
H—Royal Decree of February 8th, 1917.
I—Convention of Madrid, dated June 17th, 1918 (as modified on June 4th, 1919).
J—Royal Decree of January 18th, 1920.

LAW OF OCTOBER 26TH, 1907.

THE GOVERNMENT OF SPAIN IS HEREBY AUTHORISED TO ESTABLISH AND DEVELOP THE WIRELESS, CABLE AND TELEPHONE SERVICES.

A H.M. Don Alfonso XIII, by the grace of God and by the Constitution, makes it known by these presents that Parliament has decreed and he, the King, has given his Royal assent to the following :—

ART. 1.—The Government is hereby authorised to establish and develop the wireless, cable and telephone services—availing itself of the co-operation of national institutions—by means of a Royal Order which will be published within four months from the promulgation of this law.

ART. 2.—The expenses entailed by each service will be covered by the takings of the concession itself. In the case of certain concessions, the proviso is reserved that the establishment may be taken over by the State in whole or part, by Royal Decree, should the so doing be considered as in the national interests.

ART. 3.—Concessions regarding these new services will be granted by public tender, and all necessary conditions must be fulfilled in order to safeguard the interests and security of the nation.

It is therefore decreed :

That all tribunals, magistrates, prefects, governors and all persons in authority, whether civil, military or ecclesiastical, whatever their rank and dignity, must obey and see to it that this law is observed in all its parts.

Given at the Royal Palace on October 26th, 1907.

GENERAL RULES.

PROMULGATED BY ROYAL DECREE AS THE BASIS FOR THE ESTABLISHING OF WIRELESS SERVICE IN SPAIN.

B ART. 1.—The establishing and exploitation of all systems and apparatus available for the so-called "Hertzian telegraphy," "etherial telegraphy," and "radiotelegraphy," and all similar processes already invented or which may be invented in the future, shall be considered as included among the State monopolies regarding all means of electrical communications.

ART. 2.—The establishing and exploitation of the above telegraphic systems shall be controlled by (1) the Minister of the Interior in all matters appertaining to the general civil applications of the said systems, and (2) by the Ministers of War and Marine when and where those applications are specially connected with national defence and with the army and navy.

ART. 3.—All other official departments requiring a radiotelegraphic service can erect wireless installations by previous agreement with the Minister of the Interior. Such installations will be under the regulations established for the regular wireless service and wireless experiments.

ART. 4.—No experiments with the above-mentioned systems can be instituted in the Peninsula, or in the Balearic and Canary Islands, or in Spain's African possessions, without the authority of the Ministers of War, Marine or Interior, according to the kind of experiment which it may be proposed to carry out. Such experiments and trials shall be carried out under the official inspection of the respective departments responsible, excepting only those of a technical character carried out by the personnel of the scientific institutions of the State. These shall be independent of the said departments, providing they adhere to the regulations laid down.

ART. 5.—The Minister on whose authority the above installations and experiments are established and effected must give notice thereof to the other Ministers, giving them also full particulars regarding their service and conditions.

ART. 6.—Acting in agreement with the Ministers of War and Marine, in the cases herein aforesaid, and acting independently in all other cases, the Minister of the Interior can authorise the installation of wireless stations, provided that none have been officially installed, when the said installations may have been applied for by individuals, societies, corporations or national institutions, subject to the following rules :—

(1) The applicant shall address himself in the first instance to the Minister of the Interior, stating clearly the place where the installation is to be erected, and supplying a plan of the building, together with the conditions and advantages of the locality.

(2) Such installations and the services they are expected to render shall be subject to the special rules and conditions laid down in each case, and to the general regulations established by the State for its own installations and wireless service.

(3) The Government shall have the right to close the service under extraordinary circumstances affecting the safety of the State and the maintenance of public order.

(4) The Government shall also have the right to acquire by purchase, whenever it may be considered convenient, and with the previous payment of an indemnity, the wireless installations hereinbefore mentioned and the valuation for such compensation shall take into consideration the actual condition of the material and of the installation itself.

(5) The concessionaire shall let the Minister of the Interior know, in good time, the date on which the station or stations will start working, in order to allow the personnel of the telegraph office the necessary time for their nspection.

(6) The petitioner must not consider himself entitled to proceed with the work of installatiom until the necessary authorisation has been granted.

The following rules were added by Decree of July 10th, 1914.

(7) If the stations are to be fitted up merely for the reception of messages and for scientific purposes, or to serve as auxiliaries to meteorological observatories, authorisation for the same can be obtained from the Minister of the Interior, provided that the application be made by an Official Institution or by a private individual acting with the support of an Official Department.

(8) These receiving stations must be inspected by the Director of Telegraphs of the locality where they are installed.

(9) The persons appointed to carry out the reception must take an oath before the Civil Governor of the Provinces, to keep secret all information they may gather from the radiotelegraphic messages.

ART. 7.—The ships belonging to the national mercantile marine can instal on board wireless stations worked on any of the wireless systems in current use, provided they obtain a special permit to do so from the Minister of Marine, who will grant it in accordance with the conditions established by the International Agreement and Service Regulations adopted in Berlin on November 3rd, 1906.

ART. 8.—Permits to establish wireless installations will not be granted to any private individual, society, or corporation belonging to a foreign nationality.

ART. 9.—Any person or persons exploiting or using clandestinely any system of wireless, or any person or persons attempting to conduct wireless experiments with apparatus available for the purpose, will be prosecuted in conformity with the Penal Code, the general law, the military orders, or the administrative regulations, as the case may be. Prosecution for these offences will be carried out by the authorities entrusted with the administration of the said laws, orders and regulations; and the State will confiscate all material employed for such purposes.

ART. 10.—By agreement between the Ministers of War, Marine and Interior, the wireless stations which may be considered necessary and convenient for commerce, navigation and national defence will be erected on the seaboard of the Iberian Peninsula, on the Balearic and Canary Islands, and in the African possessions of Spain.

These installations will be under the control of the aforesaid three Ministers, as the case may be, both in the matter of supplies and of personnel and offices, and they will form a part of the national telegraphic system.

This linking up of the wireless with the land telegraphic service will be effected by the ministerial department controlling the various wireless installations.

ART. 11.—Authorisation is hereby given for the interchange of messages between ships belonging to the national mercantile marine and those belonging to foreign nations carrying wireless installations of current systems, and also for the interchange of messages between the said ships and the coast stations already established or to be established by the Ministry of the Interior on the sea board of the Peninsula on the Balearic and Canary Islands, and in the Spanish possessions in Africa.

The Minister of the Interior shall determine the date of the inauguration, the extension and the class of service of each station.

ART. 12.—The Government shall have the option of refusing or accepting those wireless systems the details of which have not been made public.

ART. 13.—The State accepts no responsibility for the wireless service. In the cases of errors or of non-delivery of radiotelegrams the procedure followed will be as established in Art. 35 of the Berlin regulations.

ART. 14.—Whatever the object of the installations, the wireless service shall be organised, whenever possible, in such a way as not to disturb other services of the same kind, or class. The ministerial departments interested shall adopt in each case such rules and regulations as may be found necessary, and shall also arrange regulations with other States regarding frontier installations.

ART. 15.—All wireless services, whether public, official, or private, carried on through the intermediary of land, coast and ship stations, shall be subject to the regulations hereunto attached.

ART. 16.—In addition to the rules herein contained, and those of the regulations mentioned in the previous Article, the provisions affecting Radiotelegraphy contained in the International Convention made in Berlin on November 3rd, 1906, together with the Service Regulations appended thereto, must be observed.

ART. 17.—The Director-General of Posts and Telegraphs shall see to the fulfilment of the stipulations made by Art. 13 of the International Agreement and of those made by Art. 37 of the Berlin Regulations, regarding the International Bureau established in Switzerland. The Ministers of War and Marine shall in accordance thereunto furnish the data required, which must be in the possession of the naval and military installations and stations and also data affecting the merchant ship stations, whose installations are authorised by the Minister of Marine.

ART. 18.—Messages received from or transmitted directly to a country or ship registered in a country which is not a signatory of the convention and regulations of Berlin, can only be admitted through the Spanish telegraphic system and through the coast wireless stations after a declaration has been made by the country in question expressing an intention of applying the rules laid down by the said convention, and their regulations regarding the regular routine of the messages and the security of the accounts. In their radiotelegraphic service the coast stations shall give preference to the service of those countries which have become parties to the international agreements.

Articles 19 *to* 34 *and the additional articles appended thereto deal with wireless installations on fortresses.*

REGULATIONS.

GOVERNING THE WORKING OF THE WIRELESS STATIONS IN SPAIN.

GENERAL SERVICE.

ART. 1.—All persons are allowed to make use of the wireless service, but the Government reserve to themselves the privilege of suspending for an indefinite period, as they may judge convenient, either every class of communication or such commu-

nications as belong to some particular class, or communications which affect some special station or stations.

Art. 2.—The following regulations and conditions laid down for the radiotelegraphic service in Spain, besides the provisions affecting radiotelegraphy contained in the International Convention made in Berlin on November 3rd, 1906, together with the Service Regulations appended thereto, shall be applied to all wireless stations, whether public, official or private, on the coast of the Peninsula, the Balearic and Canary Islands, the African possessions of Spain, and to all ships navigating those territorial waters.

Art. 3.—Ship stations shall be free to select their system of wireless installation; but for coast stations the administration shall adopt the system and equipment judged to be the best available from the point of view of scientific, technical and economic progress.

Art. 4.—All coast wireless stations shall be linked with the general telegraphic system, by means of private lines, in order to secure rapid communications.

Art. 5.—The working of wireless stations of all classes shall be carried out in such a way that, as far as possible, no disturbance may be occasioned to other stations of the same kind.

Organisation of Wireless Stations.

Art. 6.—Wireless stations of all kinds must maintain reciprocal communications with the least possible waste of power.

Art. 7.—Wireless stations in Spain shall use the international signals of the Morse Code for the transmission of messages.

Art. 8.—All wireless installations in Spain including both coast and ship stations, open to the public, must carry on an interchange of messages irrespective of their wireless systems.

During the working hours fixed for each coast station the latter must receive the Morse signals and must also have a transmitter so disposed as to be able to reply in the signals of the same code.

Art. 9.—Coast wireless stations must accept and must give *absolute priority* to calls for help from ships in danger. They must, moreover, answer the said calls in the same order of priority and pass them on as urgent messages to the general telegraphic service.

Art. 10.—The administration shall establish three classes of stations—viz., public, official, and private. Those of the first class must have a radius of 600 kilometres and over, those of the second class one of 400 kilometres (there or thereabout), and those of the third class one of 200 kilometres. Exceptions may be made in accordance with practical experience in working.

Art. 11.—First-class stations shall have three wavelengths at their disposal—namely, one of 300 metres, another of 600 metres, and another which may reach the maximum length, but which must not be less than 1,600 metres. The last two will be used normally. The second and third-class stations shall have two wavelengths—namely, one of 300 metres and one of 600; and those of the second class will use normally the 600 metres wavelength, whilst those of the third class will use one of 300 metres, except in the cases referred to in Art. 14 final paragraph.

Coast stations situated near each other may maintain a special service between each other, provided that the distance between them allows of their doing so; but they must give preference to the Maritime Service. In the latter case, and for communications with national vessels on official matters, coast stations of both classes are allowed to use the special wavelengths to which their installations are adapted or adaptable for these services.

Art. 12.—Ships belonging to the Spanish Merchant Service shall use a normal wavelength of 300 metres, but they can alter this to a maximum of 600 metres.

Only in exceptional cases are vessels of small tonnage allowed to use ***normal waves*** of less than 300 metres.

Art. 13.—The General Post and Telegraph Office shall publish and keep always up to date a Directory showing the coast and ship wireless stations authorised and open to the public; together with the following information:—

(1) Name and geographical position of the coast station; identification signal in the International Code, and the port of register of the ship fitted with wireless.

(2) Call letters. (These must be all different and must be formed by groups of three letters.)

(3) Normal range.

(4) Wireless system adopted.

(5) The class of receiving apparatus whether automatic of auditive, etc.

(6) Length of waves used by the station. (The normal wave must appear in italics.)

(7) Class of service rendered by the station. This covers such items as general communication, restricted communication (*i.e.*, communication with ships, with steamship companies, with ships fitted with apparatus of the same system, etc.); public long distance communications; communications of a private nature; special communications (*e.g.*, those of an exclusively official character), etc.

(8) Hours of service.

(9) Coast and ship station rates.

The Directory above-mentioned shall also include information regarding wireless stations not open to general public service and the existence of which has been made known to the International Bureau by the Spanish Administration.

Art. 14.—Wireless service in coast stations shall be, whenever possible, of a continuous nature, operating both night and day without interruption.

The Post and Telegraph Office shall fix, in each case, the hours of service of those stations where the service is limited.

Coast stations where the service is not of a continuous nature cannot close for the day without having transmitted all radiotelegrams to ships within their sphere of action and without having first received all the radiotelegrams advised by them. This proviso shall also apply in the case of ships signalling their presence before the closing hour of the station.

Art. 15.—Private corporations cannot instal ship stations nor can they work any such station without Governmental authorisation. Permits in these cases will be issued in accordance with the provisions of the Berlin Convention and Regulations, by the Ministry of Marine, and will be communicated by the latter to the General Post and Telegraph Office.

Ship stations duly authorised must fulfil the following conditions:—

First.—The system employed must be a tuned system.

Second.—The speed, both for the reception and transmission of messages, must not under

normal circumstances be less than twelve words per minute, allowing five letters to the word.

Third.—The power transmitted to the wireless apparatus must under normal circumstances, not exceed one kilowatt. Nevertheless, greater power can be used if the ship is obliged to communicate over a distance exceeding 300 kilometres from the nearest coast station; or, if by reason of any interference, no communication can be established without increasing the power.

The service of the coast and ship stations shall be attended to by operators having their qualifying certificates issued by the General Post and Telegraph Office. This certificate must state the professional knowledge of the operator in the following matters:—

(*a*) Equipment of the apparatus.

(*b*) Auricular transmission and reception at a speed of not less than twenty words per minute.

(*c*) The knowledge of the regulations regarding interchange of wireless communications.

The qualifying certificate must also state that the Government has notified the operator that it is his duty to treat all communications as confidential.

Steamship companies are allowed to employ their own qualified operators provided they fulfil the conditions hereinbefore mentioned.

The Making-out and Presentation of Messages.

Art. 16.—For the making-out and presentation of radiotelegrams the provisions of Articles 10, 11 and 33 of the Berlin Conference Regulations, in addition to the rules laid down in the following Articles, shall be observed.

Art. 17.—Radiogram forms must have the words Radio Service on the heading.

On the transmission of messages from ship to coast stations no mention will be made of the date and hour of deposit.

On the re-transmission of the telegraph lines the coast stations shall note their own name as that of the station of origin, followed by the name of the ship, and shall register as the hour of transmission the time at which the radio was received by them.

Art. 18.—The instructions for delivery of messages destined for ships at sea must be as complete as possible. The form must be filled up as follows:—

First.—The name of the addressee with additional indications if necessary.

Second.—The ship's name as it appears in the Directory, adding her nationality, and if necessary, as in cases where there are two or more ships of the same name, adding also her identification letters in the International Code.

Third.—The coast station name as it is given in the Directory.

Art. 19.—The following messages will not be admitted:—

(1) Reply-paid messages.

(2) Money orders.

(3) Messages to be paid on delivery.

(4) Messages demanding acknowledgment of reception.

(5) Messages to be forwarded.

(6) Messages at special rates, except those for transmission on the telegraphic section or over-land wires.

(7) Messages marked "urgent" except on the over-land wired service, and then only with the reservation that the provisions of the international telegraphic regulations must be applied.

(8) Messages to be forwarded by post or express.

Art. 20.—The messages may be written in plain language or in code in accordance with the interior regulations for ordinary service and with the international conventions on the matter.

Art. 21.—The officials at the stations can ask the senders of wireless messages to prove their identity.

Rates and Executive Regulations.

Art. 22.—In the counting of words in order to apply the rates the officials must follow the provisions of Articles 18, 19, and 20 of the International Telegraph Service Regulations as revised in London in 1903.

Art. 23.—In conformity with Article 10 of the Berlin International Convention, the total rate for wireless messages shall include:—

(1) The rate applicable to the maritime section, namely,

(*a*) the rate in force at the *coast station.*

(*b*) the rate in force at the *ship station.*

(2) The rate established for the overland wired service, national or international, calculated in accordance with the general rules.

Art. 24.—The rate applicable to the maritime section is hereby fixed at 0.75 pesetas per word, of which 0.45 belongs to the coast station and 0.30 to the ship station.

With regard to the international service, in the case of messages to and from foreign ships, these rates shall be payable in francs, on the same basis.

The rate applicable to the overland wired service, national or international, shall be calculated and allocated in accordance with the interior regulations and with the international regulations.

The minimum rate applicable to the maritime section of wireless messages is hereby fixed at 7.50 pesetas, which is the wireless rate for a radiogram of ten words.

Art. 25.—The coast station rate will be charged only once, even if the message goes through several coast stations.

Art. 26.—The whole cost of the radiotelegram must be paid by the sender, and at ship stations a tariff indicating this must be displayed.

Art. 27.—For the purposes of book-keeping the coast station must consider itself as addressee with regard to the messages coming from the telegraphic service on their way to ship stations; and the coast station must consider itself as the original office with regard to the messages coming from ship stations for transference to the telegraphic service.

Art. 28.—Coast and ship station rates shall be calculated in accordance with the number of words computed, and in accordance with Article 23 of these Regulations.

Art. 29.—Merchant ships at sea can interchange messages if they find it convenient. The rates to be charged in such cases shall be laid down by the respective owners and shall not be taken into account by the National Administration.

Art. 30.—Ship stations on Spanish vessels shall send to those chartering them, upon their arrival in port, all documents in connection with and referring to all messages exchanged

with coast stations. The charterers shall send such documents monthly to the General Post and Telegraph Office, where it will be kept for a minimum period of twelve months and where liquidation of the accounts must be made in due course.

Art. 31.—The installations on Spanish men-of-war shall use, in their communications with the coast stations open to the public, the wavelengths which—under the terms of the Berlin Regulations—may be agreed upon between the Minister of Marine and the Minister of the Interior for the official service.

Both Spanish and foreign men-of-war can exchange private messages with the coast stations or with merchant ships; but only for the benefit of their crews. In such cases the technical and tariff provisions of these Regulations and those of the Berlin Convention and the Berlin International Regulations for the transmission of public correspondence, must be observed, as in the case of a merchant ship station open to the public. The regulations established to prevent the disturbance of wireless communications must be most carefully adhered to.

Art. 32.—When men-of-war exchange messages (private) with coast stations or with other ship installations they must follow the rules established for the computation of words and the collection of rates. In such cases the ship's purser in the Spanish vessels and the Minister of Marine shall respectively exercise similar functions to those assigned to the administration on board, and to the owner, as far as merchant ships are concerned.

In the calculation of coast and ship station rates for private service exchanged with foreign men-of-war, the General Post and Telegraph Office shall come to an understanding with the Administration of the country to which the said men-of-war belong.

Art. 33.—The same provisions shall hold good in the case of a military wireless installation, either permanent or portable, when the said installation utilises the stations established by the Administration for Public Service.

Art. 34.—Should, by some accident, the Submarine Cable Service be substituted for the Wireless Service for the sending of a message, the former shall only receive the rate applicable to a coast station. If communication by wireless is established between two points in Spanish territory otherwise without telegraphic communication, the rates charged shall be those of the Interior Telegraphic Service, and the rules of that service shall apply, except in the cases provided for in Article 19 of these Regulations.

Art. 35.—In the matter of transmission of messages, of the signals to be employed in them, orders of transmission, calls, acknowledgments of receipt, instructions as to the route to be followed by the radiograms, and instruction as to their final destination, the provisions made in Articles 15 to 32, both inclusive, of the Berlin Regulations must be observed.

Art. 36.—In cases when the return of charges made for radiotelegrams has been justly established the provisions of Article 35 of the Berlin Regulations must be observed.

Book-keeping.

In matters referring to book-keeping for the international wireless service the provisions of Article 36 of the Berlin Regulations must be observed.

General Rules.

Art. 38.—Coast stations, previously authorised by the General Post and Telegraph Office, shall furnish the authorised agents of Maritime Information Bureau with all such particulars concerning wrecks and disasters at sea as are of any interest to navigators, always provided that the said agents apply for such information.

Art. 39.—Authorised interchange of messages between ship stations on the high seas must be carried out in such a way as not to disturb the coast station's service. The latter shall have, as a general rule, the right of priority for Public Service.

Art. 40.—The order of transmission between ship stations on the high seas shall be settled by agreement between themselves.

The re-transmission of messages between ships at sea shall be arranged by agreement between the interested parties.

Art. 41.—The provisions of the International Telegraphic Regulations shall be applied by analogy, to radiotelegraphic communication as far as they are not antagonistic to these Regualtions, or the Convention, Additional Agreement, and the International Regulations of the Berlin Conference.

Art. 42.—The provisions of Articles 5, 6 and 9 of these Regulations shall apply to all classes of wirelees installations, official and authorised, even if they are not open to Public Service.

Madrid, January 24th, 1908.

Approved by His Majesty the King
—Maura.

(Seal.)

Royal Order of September 4th, 1914.

Art. 1.—According to the Royal Order of January 25th, 1908, the inspection and regulation of the Wireless Telegraph Service on board vessels of the Mercantile Marine are under the supervision of the Minister of the Navy, and by delegation to the Director-General of Fisheries and Merchant Shipping. The installations should fulfil all the requirements of the said Royal Order together with the rules and regulations of the London Radiotelegraph Convention of June, 1913, and the Rules of the Safety of Life at Sea Convention, January, 1914.

Everything affecting the service shall be controlled by the Navigation Department, which shall attend to the following matters:—

(1) The registration of all new installations authorised.

(2) The forwarding of all documents regarding such new installations accompanied by the order for their recognition.

(3) The sending of a report to the Home Office and War Office as to the result obtained from the various installations, together with indications of their characteristics.

To attend to this service the Director of Navigation and Fisheries will nominate a chief or a superintending official, together with five wireless inspectors on the coast, and this staff must have the qualifications as set forth in the Royal Order of May 21st last.

Art. 2.—The distribution of the staff on the coast and in the maritime provinces under each inspector shall be as follows:—

Barcelona.—Maritime provinces of Barcelona, Tarragona, Valencia, Mallorca, and Minorca (the residence of the inspector being at Barcelona).

Cartagena.—Maritime provinces of Alicante, Cartagena, Almeria, and Malaga, Melilla and Ceuta (the residence of the inspector being at Cartagena).

Cadiz.—Maritime provinces of Cadiz, Canary Islands and Huelva (the residence of the inspector being at Cadiz).

Vigo.—Maritime provinces of Vigo, Pontevedra, Villagarcia and Coruña (the residence of the inspector being at Vigo).

Bilbao.—Maritime provinces of Gijon-Santander, Bilbao and S. Sebastian (the residence of the inspector being at Bilbao).

Art. 3.—The wireless inspectors shall be under the orders of the Commandante de Marina of districts to which they are attached and in the ports of which they will have to make their annual inspection. They will only be allowed to leave their habitual place of residence when, for the convenience of the shipbuilders, they have to inspect a station in any other part of their district.

Art. 4.—The wireless inspectors must attend to the following duties:—

(*a*) To verify and inspect all new installations concerning which they may have been notified by the Director-General of Navigation and Fisheries that they are ready for public service, and to send in a report of the result of their verification and inspection.

(*b*) To visit annually the installations of such ships as are registered in the ports belonging to the districts within their jurisdiction, and to issue the necessary certificate according to the London Safety of Life at Sea Convention.

(*c*) To inspect foreign ship stations on board vessels which take passengers in Spain with the object of verifying that they are in possession of the certificate issued under the Safety of Life at Sea, which certificate must have been issued by the maritime authorities of their respective countries.

(*d*) To report to the Director-General all remarks or complaints made by the shipowners, crew or passengers in regard to this service so that the aforesaid Director may take such necessary steps as he may think fit.

(*e*) To see that all the staff that work the installations are in possession of the Government certificate according to the law of January 24th, 1908, with the object of making sure that all these installations are handled by duly qualified operators.

Art. 5.—For these duties a register book will be given to the wireless inspector in which he shall note the following particulars of each visit:—

(*a*) Date and place of inspection.
(*b*) Name of the vessel.
(*c*) System, radius, wavelengths, etc.
(*d*) Names of operators and dates of their certificates.

A copy of this information is to be sent every quarter to the Director-General in order that he can make out a list and maintain a register devoted to all important information and data.

Art. 6.—The naval and marine authorities will do their best to facilitate the work of the inspector, putting at his disposal the *craft* and *personnel* required by him for the fulfilment of his duties.

Art. 7.—When it is desired to instal a wireless station on board a ship, the builder, the owner, the agent or the captain must ask for permission from the Director-General of Navigation and Fisheries. As soon as the installation is completed the applicant must notify the above authority, stating the port in which he desires the visit to be made, so that the wireless inspector may receive instructions accordingly.

Art. 8.—Wireless installations are subdivided into three classes:—

(1) Stations with permanent service.
(2) Stations with limited service.
(3) Stations with special service.

Class 1 includes all vessels which carry twenty-five or more passengers and which have an average speed of fifteen or more knots. This class includes also ships carrying 200 or more passengers, having a speed of over thirteen knots, and travelling a distance of over 500 miles between two consecutive ports. The latter vessels should carry at least two telegraphists.

To Class 2 belong all the steamers not included in Class 1, provided they are fitted to carry twenty-five passengers or more. During the voyage the ships of this class must have one telegraphist on constant watch during seven hours per day and ten minutes at the beginning of the other hours.

In cases where the vessel is more than 500 miles distant from the nearest coast, the watch must be permanent.

To Class 3 belong all ships which are not included in Classes 1 and 2, and having fifty or more persons on board and carrying less than twenty-five persons or none.

The watch service on these ships must be continuously maintained during a transatlantic voyage or when the ship is over 1,000 miles distant from the coast. In special circumstances, and whenever advisable for the safety of life at sea, ships of every class may be obliged to keep a constant watch.

Vessels belonging to subsidised Government lines are obliged to carry wireless no matter where they sail or what crew they carry.

Art. 9.—The radius of the wireless station shall be a minimum of 100 miles at sea in daytime when communicating with ships under normal conditions and circumstances.

All the stations must be provided with an emergency set, installed on the upper deck, which must be kept in the best condition, having a source independent of the main electric supply and capable of being set in instant working order; this set must be able to work during six hours at least, and must possess a radius of a minimum of eighty miles for ships of the first class and fifty miles for the others.

Art. 10.—When testing the transmission and reception of messages, both installations shall be made to work with a ship at a distance of about 100 miles.

The wavelength and the oscillation current of the aerials must be measured.

When the Director-General thinks it necessary, the curves of resonance will have to be made and the degrees of coupling adjusted. When it is necessary to test the state of the receiving apparatus, the Director may order that one or several of the officers in that service shall mark trial tests with the different stations at various distances during the voyage.

Art. 11.—Inspections must be made at the ports of Barcelona, Cartagena, Cadiz, Vigo and Bilbao, which are the places of residence of the wireless inspectors. However, if for the convenience of builders, the inspection should be carried out at some other port, these builders must defray the travelling expenses of the said inspector.

ART. 12.—The radio inspectors shall receive remuneration for all the inspections they carry out with regard to wireless installations.

The amount of this remuneration shall be 100 pesetas with an increase of twenty-five pesetas for each auxiliary transmitter which the ship may carry independent of the emergency installation. Such remuneration shall be the same whatever the rank held by the radio inspector.

The annual inspections held for the issue of certificates in accordance with the provisions of the London Safety of Life at Sea Convention shall be made free of charge.

(Signed) RAMON ESTRADA,
Director-General of Navigation and Marine Fisheries.

Madrid, September 4th, 1914.

ROYAL DECREE DATED FEBRUARY 20TH, 1917.

Inscribed in the Official Record Under No. 49.

His Majesty the King (whom God save) inspired by the sentiment of humanity, of which the crews of the merchant ships, which in these difficult times with bravery and with risk to their lives maintain our maritime commerce are deserving, has, in accordance with the proposal of the Director-General of Navigation and Sea Fisheries, designed to decree—

1. All merchant ships of 500 tons and upwards which make long sea voyages or long coasting voyages must carry a wireless installation having a minimum range of 100 miles, as laid down under the International Radio-telegraphic Convention.

2. Similarly the said ships will carry one or more lifeboats in proportion to the number of the crew, each fitted with its own motor, or provided with adjustable motors of such a kind as to answer the same purpose.

3. Local directors of navigation shall allow a certain time for each ship to be provided with these things, the shipowners having to certify before the said authorities that they have taken the necessary steps or made definite contracts to obtain them.

ROYAL DECREE DATED JUNE 22ND, 1917.

In view of the request made by the "Cia Nacional de Telegrafia sin Hilos," His Majesty the King (whom God guard) has been pleased to order that all the radiotelegraphic stations concerned in the Royal Decree of Feb. 20th last inscribed in the Official Record under No. 49 shall carry emergency installations in accordance with Article 9 of the regulations for the service of installation and inspection of radiotelegraphy on board merchant ships on September 4th, 1914, excepting those installations which have sources of energy independent of that which forms a regualr part of the ship's equipment and is fitted on deck.

Madrid, June 22nd, 1917.

ROYAL DECREE DATED OCTOBER 12TH, 1917.

Issued in the form of a Circular Published in the Official Gazette of the Spanish Ministry of Marine No. 235 of November 19th, 1917.

In view of the collection of information by this Administration for the fulfilment of the Royal Orders of February 20th, and June 16th last (inserted in the Official Gazette of this Ministry and numbered 29 and 143 respectively) relative to the complete installation of wireless telegraphs on board merchant vessels of 500 tons and upwards, which are engaged in overseas and extended coasting trade, with a minimum range of 100 miles, on the conditions notified in the regulations governing wireless telegraphy.

And in view of the data recently communicated by the companies "A. E. G. Thomson Houston Iberica" and "Nacional de Telegrafia sin Hilos," the former saying that its resources permit the construction of 25 stations per month and that within one year 300 can be provided, whilst the latter give an assurance that they are able to supply wireless stations with the least possible delay, but not defining the duration of this delay.

It resulting from previous communications from this department that there are 57 stations already fitted and arranged for, and that there remain some 80 to be constructed or fitted.

It resulting, moreover, that this Administration deems a delay of eight months to be sufficient for the "Compañia Nacional de Telegrafia sin Hilos" to supply these 80 stations, that company being looked upon as a firm reputed in the business world as of good standing and with resources fully equal to those of the "A. E. G. Thomson Houston Iberica" and the delay of eight months being the double of that within which the latter undertake to fulfil those engagements.

His Majesty the King (whom God guard) in conformity with the information supplied by the Administration, and in agreement with his Privy Council, has thought it well to dispose that, beyond a delay of eight months from the date of publication of this Royal Order, the sailings of the ships mentioned in his Decree of February 20th of the present year shall be stopped if they fail to be fitted with complete wireless stations in accordance with the existing regulations, and that the Marine authorities in the provinces shall carefully communicate this decision to those who appear in their books as proprietors of the respective ships.

ROYAL DECREE OF FEBRUARY 8TH, 1917.

ART. 1.—All civil private wireless stations, whether they be transmitting and receiving stations, receiving alone, or assigned for the use of scientific or auxiliary meteorological observatories, are subject to the inspection of the Government, such inspection being carried out by the Home Office and the General Direction of Posts and Telegraphs.

The inspection shall be carried out by telegraph officials, and its object is to promote public order and interest, and protect the rights of the communication monoply that belong to the State, in fulfilment of the present dispositions on the matter and in strict observance of the concession conditions.

In accordance with the rights granted by contract with the State to the "Compañia Nacional de Telegrafia sin Hilos," this company can also perform the inspection of the above-mentioned wireless stations at her own expense.

The appointment of inspectors by the company shall be countersigned by the Postmaster-General, and when in performance of their duty will be treated as public officials and be granted the same facilities in the exercise of their duties as those given to the Government inspectors stated in Arts. 3 and 4 of this Royal Decree.

The Home Office shall decide all questions which might arise in the carrying out of this private inspection.

ART. 2.—In addition to the inspection work which the Home Office or the Postmaster-General may at any moment judge convenient to carry out a constant inspection service shall be carried out in the said civil radiotelegraphic stations under the Spanish State authorities.

ART. 3.—To carry out the constant inspection service stated in the preceding article, an inspector for each station shall be appointed by the Postmaster-General, who shall superintend the work, and the station shall not be used even for scientific purposes, except under his personal supervision. The inspector shall adopt such measures as he thinks fit to prevent the station being used during his absence.

When the working of a station cannot be attended to by one official alone, the Postmaster-General may assign two or more inspectors, and distribute between them the work of the station as he may judge convenient.

ART. 4.—Access will be allowed to the inspector of the station at any time of the day or of the night without need of permission, request, or notice of any kind.

For this purpose the keys of the place or places in which the apparatus is installed shall be given to the inspector by the owner or licensee of the station, so that no obstacle or delay may prevent his entrance.

ART. 5.—A weekly report of the general working condition of the station, stating the nature of the service, the day, hour, and minutes when they were effected, and any observation the inspector may judge should be specially noted, should be sent by him to the Telegraph Direction.

Immediate notice shall also be given by the inspector to the General Telegraph Direction of any technical or legal anomaly observed in the working of the station, and the orders of the authority shall be transmitted, executed, or caused to be executed by the said inspector.

ART. 6.—All applications for license to instal a radiotelegraphic station must comply with the following conditions, as well as with all others in force at the time :—

(1) The purpose for which the station is to be employed must be clearly expressed.

(2) A plan of the site where the station is to be installed, its communication with the public street or road, and the places where the apparatus are to be mounted in a 2 per cent. scale, and another plan with diagram of connections and details of aerial in a 10 per cent. scale, shall accompany the request for the licence.

(3) A detailed list of the apparatus specifying their nature, trade mark, and manufacture number (if any), must accompany the application.

(4) The name, age, address, and professional title (if in possession of one) of the operator or operators who will work the station must be stated.

The Home Office Minister can grant or refuse the concession of the license, and can also modify the technical conditions of the installation before or after the licence has been granted.

ART. 7.—No modification either of the installation or disposition of the station is allowed without authorisation of the Home Office Minister acting on information of the appropriate inspector.

All modifications should be reported to the General Telegraph Direction by the inspector of the station.

ART. 8.—Before a station is opened the proprietor or licensee will deposit a sum of 5,000 pesetas in the general safe of deposits at the disposal of the Postmaster-General, and set aside to cover the pecuniary obligations which the proprietor or licensee might incur.

This sum must be replaced should it diminish or disappear in making good the obligations for which it is set aside.

ART. 9.—The proprietor or licensee must pay all expenses incurred by the final inspection. These expenses comprise a sum which will be fixed by the Postmaster-General, and which must not exceed 2,000 pesetas per annum, to be given to the inspector in monthly payments as a reward for his services, and in payment of all office expenses.

Office accommodation should also be provided for the inspector of the "Compañia Nacional de Telegrafia sin Hilos," should there be one.

Should there be no telegraph office in the place where the station is installed, the proprietor or licensee must provide decent food and lodging for both the official and private inspectors, should there be any.

ART. 10.—The General Direction will classify as major or minor offences any infringements by the proprietor or licensee or any of their staff of this Royal Decree or any other standing orders in this regard.

In all cases the following will be considered as a major offence :—

(1) Not fulfilling the conditions of the license.

(2) Any modification in the installation or arrangement of the station without due authorisation of the Home Office.

(3) Deliberate obstruction of the inspector with regard to free access to the station under his charge.

(4) The using of the station for any service without the presence of the inspector.

(5) Infringement of the terms of Art. 8 of the Royal Decree.

ART. 11.—Apart from other criminal or civil responsibilities involved in the offences enumerated in the preceding article, the following penalties will be exacted :—

(*a*) Fine of 100 to 500 pesetas for petty offences.

(*b*) Fine of 501 to 2,000 pesetas for serious offences, together with loss of the licence and apparatus. The station will be dismantled at the General Direction of Telegraph's will.

The working of the station may be immediately suspended by the inspector on his discovery of any of the offences enumerated in numbers 1, 2, 3 and 4 of the preceding articles.

ART. 12.—Apart from other criminal responsibilities binding upon the inspector, acts of commission or omission infringing this Royal Decree or any other standing regulations on the matter will be considered as serious offences, and will be punished in accordance with the rules and regulations of the Post and Telegraph Corporation. Should the inspector not belong to the said corporation (*i.e.*, hold the rank of private inspector), the offence will be punished with the fine of 100 to

2,000 pesetas and disability from continuing in his office, the "Compañia Nacional de Telegrafia sin Hilos" being responsible for the payment of the fine.

ART. 13.—Any illicit station discovered shall be immediately dismantled, the General Direction taking possession of all apparatus. The proprietor and any other persons who may be found guilty of installing or working such a station shall, apart from other criminal responsibilities to which they be liable, be punished with a fine of 2,000 to 5,000 pesetas.

The owner of the building, director of the establishment, society, or corporation in whose premises a clandestine station is installed, and who, as soon as it comes to his knowledge, does not report the fact immediately in the quickest possible way to the General Direction, will incur the same responsibilities.

ART. 14.—Trial for these offences shall be held in public.

An informer shall be entitled to half of the amount of the imposed fine.

ART. 15.—The use of radiotelegraphy granted to official centres for scientific purposes and worked by public officials is not subject to constant inspection, and is excused the deposit referred to in Article 8. The service will not be suspended, nor the apparatus confiscated, should any infringement be committed by the licensee or staff; but the persons guilty of the offence shall be subject to the criminal or civil responsibilities which may personally affect them. A report will be sent in by the Minister of the Home Office to the Minister under whose supervision the station is administered of the offences committed in order to assure the observance of this Royal Decree, and that these offences should be noted in the personal service records.

ART. 16.—The terms of the Royal Decree do not concern the "Compañia Nacional de Telegrafia sin Hilos" (except those which specifically affect this company), and the inspection of these stations will be subject to the conditions of the contract with the State.

ART. 17.—The authorisation for the working of radiotelegraphic stations granted with priority under the Royal Decree must be carried into effect. The General Direction of Telegraphs will immediately organise the constant inspection service for the stations not comprised in Articles 15 and 16.

A term of eight days is granted from the date of publication of this Royal Decree for all private authorised existent stations to send in to the General Direction the information referred to in numbers 2, 3, and 4, of Article 6, and also make the deposit ordered in Article 9. If the term expires before the fulfilment of these obligations, the station will be considered as illicit, and immediate proceedings taken under Article 13, unless the licensee shall present before the expiration of the fixed term a renunciation of his license to the Minister of the Home Office through the General Direction. He must as a preliminary thereto have dismantled the apparatus.

The same term of eight days is given to those in charge of existing radiotelegraphic stations to hand over to the General Direction the information asked for in numbers 2, 3, and 4 of Article 6. Should the term expire without the fulfilment of these conditions proceedings will be taken according to Article 15.

CONVENTION OF MADRID, DATED JUNE 17TH, 1918, AS MODIFIED BY CONFERENCE OF JUNE 4TH, 1919. CONCERNING WAVELENGTHS TO BE USED BY STATIONS UNDER SPANISH CONTROL.

I

1. The undersigned have held meetings of a semi-official character in the Ministry of State, Madrid, Spain, on June 12th, 13th, 14th and 15th, 1918, for the purpose of discussing the means for avoiding interference in communications by wireless telegraphy and for the establishment of a programme which shall benefit mutually the radiotelegraph services of the various Governments represented.

2. Attached and below are three annexes marked (A), (B) and (C), in which are contained the agreements unanimously arrived at by all the representatives present.

Annexe (A) sets forth the agreements adopted.

Annexe (B) contains the organisation proposed in the transmission and reception by wireless telegraphy of the stations of the Spanish Army and Navy.

Annexe (C) includes the organisation proposed in the transmission and reception by wireless telegraphy of the stations of the Compania Nacional de Telegrafia sin Hilos and of the Ministry of State.

3. It is understood that all the agreements and arrangements are subject to the approval of the various Governments represented.

Capitan de Fragata,
Representing the Ministry of Marine.

Major R.M.L.I.
English Representative.

Naval Lieutenant,
French Representative.

Captain,
French Representative.

Corvette Captain,
Italian Representative.

Ensign U.S.I.,
Representative of U.S.A.

Director of the Official School of Telegraphy,
Representing the Ministry of the Interior.

Commander of Engineers and of the Army.
Representative of the Ministry for War.

Naval Lieutenant,
Representing the Ministry of State and of the Compania Nacional sin Hilos.

(*For Annexe (A) see next page.*)

TABLE B AS MODIFIED BY CONFERENCE OF JUNE 4TH, 1919.

Call Signs.	Name of Station.	Watching Wave. (Note 1)	Normal Transmitting Wave. (Note 2)	Other Waves used only in case of Interference. (Note 3)	General Watching Wave during (Note 1) First Five minutes of the hour.	Last Ten minutes of the hour.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
			MILITARY.			
EGA	Almeria	900	900	1200.1590.2100	600	—
EGB	Melilla	900	900	1200.1590.2100	600	1590†
EGC	Madrid	1500	2100	1500.2500.3750	—	—
EGD	Ceuta	1500	1590	900.1200.2100	600	1590†
EGE	Barcelona ..	900	900	1200.1590	600	1590†
EGF	Larrache ..	1200	1200	900.1590.2100	600	1590†
EGG	Valencia ..	900	900	1200.1590	600	1590†
EGH	Bilbao	900	900	1200.1590	600	1590†
EGI	Mahon	900	900	1200.1590	600	1590†
EGJ	Coruña	900	900	1200.1590	600	1590†
EGK	Tetuan	2100	2100	900.1200.1590	600	—
EGL	Cape Juby ..	900	900	1200.1590	600	—
EGM	Malaga	1500	1590	900.1200.2100	600	—
EGN	La Palma ..	900	900	1200.1590	600	—
			NAVAL.			
EBW	Le Ferrol ..	900	900	*1200.1590	600	450
EBX	Cartagena ..	900	1200	*1200.1590	600	450
EBY	San Fernando ..	900	1200	* 900.1500.2100	600	450
EBZ	Madrid	—	—	—	—	—
CLZ	La Caraca ..	450	450	—	—	—
—	Large ships ..	900	900	*1200.1590	600	450
—	Small ships ..	900	450	900	600	450

NOTES.—(1) A station is always to be called on his watching wave (columns 3, 6 and 7).

(2) Normally the answer to the call and the signal to transmit should be made on the normal transmitting wave (column 4).

(3) In case of interference only, one of the waves indicated in column 5 may be used temporarily to avoid such interference.

(*) 1590 metre and 2100 metre wavelengths not to be used except when communicating with EGC, EGD, EGF and EGK.

(†) The watch on 1590 metres will not be kept except when ordered.

ANNEXE (A).

AGREEMENTS ADOPTED.

1. The Agreements of the International Radiotelegraph Convention of July 5th, 1912, will be strictly observed.

2. *Always whenever possible*, communication on a wave of 600 metres will be prohibited.

3. In accordance with the Convention, Spanish merchant ships shall continue to use the 600 metre wave when communicating with commercial coast stations and between themselves.

4. Although war vessels are entitled to use any length of wave whatever, it is agreed for mutual convenience that Spanish war vessels shall not communicate with naval and military stations or between themselves on 600 metres, but with the wavelengths specified in the Annexe (B).

5. It is agreed that inter-communication between Spanish coast stations, whether military naval or commercial, shall not be made with a 600 metre wave, but with the wavelengths fixed and specified in the Annexes (B) and (C).

6. When a Spanish military, naval or commercial coast station desires to send a messago to a Spanish coast station (commercial) which listens-in on a wave of 600 metres, the call will be with a wave of 600 metres and immediately afterwards they will give each other the conventional signals to change over to the 900 metre wave, and all subsequent communication will take place on that wave.

7. No operator of a coast station or ship station shall listen-in for more than one wavelength during the same period of time.

8. As far as possible, efforts shall be made that Spanish wireless telegraph stations do not interfere with the advices transmitted by coast stations at fixed hours or with the familiar calls for assistance (llamadas de auxilio).

The hours at which those advices are transmitted by stations on a wave of 600 metres are at present as follows :—

Station.	*Call Signal.*	*Time (G.M.T.).*
Casablanca ..	CNP	0245, 1045, 1845.
Gibraltar ..	BYW	0830, 2030.
Monsanto ..	CTV	0145, 0945, 1345, 2145.
Orán ..	FUO	0030, 1400.
Toulon ..	FUT	0930, 2040.

TABLE C AS MODIFIED BY CONFERENCE OF JUNE 4TH, 1919.

Name of Station.	Call.	Watching Wave.	Transmitting Wave.	Wave to communicate with other Land and Ship Stations.	Remarks.
Aranjuez	EAA	—	3800	—	—
Barcelona	EAB	600 (Ship Stations)	2350	—	—
Cadiz	EAC	600 (except when working with EAL and EAT)	2500	900	Begins Press at 2030 G.M.T.
Finisterre	EAF	600	600	900	—
Melenara (Las Palmas)	EAL	600 (except when work-with EAC and EAT)	2100	900 (with EAT)	Begins Press at 0300 G.M.T.
Soller	EAO	600	600	900	—
Cabo de Palos ..	EAP	600	600	900	—
Santander	EAS	600	600	900	—
Tenerife	EAT	600 (except when working with EAC and EAL)	2100	900 (with EAL)	Begins Press at 0230 G.M.T.
Vigo	EAV	600	2350	—	Closed temporarily.
Sta. Isabel de Fernando Po.	EAY	600	600	—	—
Legación de Tánger ..	AB	900	300	—	Calls EAC on 600 and transmits on 300

Wavelengths longer than 600 metres, on which the aforementioned advices are transmitted, are not used in the Spanish organisation given in the Annexes (B) and (C).

9. As far as practicable, the wavelengths which have been adopted by all the nations for their press messages will be respected and not interfered with.

No press message shall be transmitted with a 600 metre wave.

10. With the object of obviating interference by the North American, English and French stations with the Spanish stations, the wavelengths selected in the Annexes (B) and (C) will not be changed as far as possible.

11. No call signal or any other working signal shall be made more than three times in each call, and no call signal shall be repeated more than three times in a quarter of an hour. (International Radiotelegraph Convention of London, July 5th, 1912, Articles XXV and XXVI.)

12. All nations represented agree to take the necessary steps to obtain the most exact syntonisation possible at all their stations with a view to ensuring the efficiency of the organisation of wavelengths given in the Annexes (B) and (C), and so that the intermediate wavelengths of 300, 750, 1050, 1350, 1650, 2200, 2750, etc., shall remain free for the use of North American, English and French warships and stations.

13. All communications by wireless telegraphy shall be limited as far as possible.

14. Meetings of a semi-official character will be held in Madrid every six months (June 1st and December 1st) between the representatives of the United States, England, France and Spain, with the object of exchanging impressions regarding :—

(*a*) Mutual organisation ;
(*b*) Means for eliminating interference ;
(*c*) Change of wavelengths ;
(*d*) Complaints.

ROYAL DECREE OF
18TH JANUARY, 1920.

On wireless telegraph and telephone installations for scientific purposes.

J Wireless telegraph, or telephone, sending and receiving, or only receiving, installations, for scientific purposes, are divided into two classes, viz. : (1) Permanent installations ; (2) Provisional installations.

Permanent installations, either for research, or as a complement to meteorological observatories, or for any other purpose, will be subjected to the prescriptions of the Royal Decree dated 8th February, 1917.

Provisional installations, or those fitted with the sole object of scientific experimenting or study of any branch of wireless communication, will be permitted by the Home Minister at his discretion for a given time, under the following conditions :—

(1) Applications shall be accompanied by a full report of the experiments and researches which the applicant intends to carry out, showing the place or places destined for these experiments, with diagrams, if possible, of the aerial, transmitting or receiving apparatus and their category and importance.

(2) It must be stated for how long the license is required in order to carry out experiments and for how many hours per day it is intended to use it.

(3) The installation shall be inspected by an appointed official of the Spanish Telegraphs, and always under the control of the local Chief of the Telegraphs.

(4) As every license will be issued for a fixed time, at the expiration thereof the installation, comprising aerial and apparatus, shall be dismantled and the matter reported to the Director of Posts and Telegraphs.

(5) Employing the installation for other than experimental and research purposes will entail a fine upon the licensee of pesetas 500 to 2,000, in addition to the confiscation of apparatus and aerial, which shall become the property of the telegraph authorities.

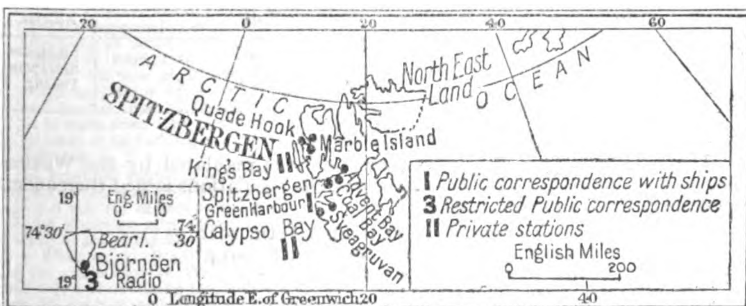
(6) The licensee shall bear all expenses consequent upon the official inspection of this class of installation, in accordance with the stipulations of the Director of Posts and Telegraphs.

(7) Installations licensed for experiments in transmission shall be operated only at the hours and on the wavelength authorised by the Director of Posts and Telegraphs, in order to prevent interference with official and public services.

SPITZBERGEN

(SVALBARD)

THIS group of barren islands, discovered by Barents in 1596, has formed the starting point for many expeditions in their endeavours to reach the North Pole. They lie in about 80° N. latitude, and between 10° and 30° E. longitude, and possess rich mineral resources. Frequent attempts have been made in recent years to open up the archipelago commercially, and with that object several companies have been formed. These com-



panies possess wireless stations which correspond with the wireless station at Green Harbour, owned and worked by the Norwegian Government.

The private stations are placed in Advent Bay (Store Norske Spitsbergen Vulkompani), Kingsbay (Kinsbay Kulkompani), Sveagruvan (Sveakol), Coalbay (Anglo-Russian Crumant Co.), Calypsobay and Marble Island (Northern Exploration Co.), and Capboheman (Isefjord Coal Co.). This last named station is not in use.

At Quade Hook is placed a meteorological wireless station which is owned by the Norwegian Meteorological Institute. No laws and regulations yet exist regarding the working of radiotelegraphy, but as the territory has been placed under the suzerainty of Norway their proximate promulgation is to be expected.

On Bear Island, situated about midway between Norway and Spitzbergen a 3 kw. Marconi Station has been erected. This land station is owned privately by the Bear Island Code Company in Tromso, and is intended for communication direct with the Government wireless station at Ingoy (Norway).

STRAITS SETTLEMENTS

(See map on p. 146.)

THE Crown Colony of the Straits Settlements comprises Singapore, Penang, and Malacca. These settlements were transferred from the control of the Indian Government to that of the Secretary of State for the

Colonies on April 1st, 1867. Labuan, the Cocos Islands and Christmas Island have since been annexed to the Colony.

The administration is vested in the hands of a Governor, aided by an Executive Council, legislation being under the direction of a Legislative Council, presided over by the Governor.

CONTROL AND ORGANISATION.

Commercial wireless telegraph stations have been erected at Paya Lebar, Singapore, opened for traffic on October 8th, 1915, and Penaga, Penang, opened for traffic on February 21st, 1916. These installations are Government land stations under the control of the Postmaster-General.

Wireless telegraphy is a State monopoly, and licenses to erect and work stations are not issued to private companies or individuals.

There are no companies engaged in the manufacture of wireless apparatus, and no wireless societies, clubs, or publications. Arrangements have not yet been completed for the installation of aviation stations, and there are no wireless arrangements for the transmission of meteorological signals.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. F. M. Baddeley	Postmaster-General	Singapore
Mr. F. H. Dupree	Engineer Operator	Singapore
Mr. S. R. Drayton	Engineer Operator	Penang

ADMINISTRATION.

The administration of wireless telegraphy is regulated by the Wireless Telegraph Ordinance of 1912, together with the regulations issued thereunder, which are printed *in extenso* below.

A—Ordinance of December 16th, 1912.
B—Regulations of January 5th, 1914.
C—Regulations of April 1st, 1919.

ORDINANCE OF DECEMBER 16TH, 1912.

A

1. This Ordinance may be cited as "The Wireless Telegraphy Ordinance, 1912."

2. The expression "wireless telegraphy" means any system of communication by telegraph as defined by "The Telegraph Ordinance, 1895," without the aid of any wire connecting the points from and at which the messages or other communications are sent or received:

Provided that nothing in this Ordinance shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

3. The Governor may, whenever he shall deem it expedient to do so, license the establishment of any wireless telegraph station or the installation or working of any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony.

4. (1) No person shall establish any wireless telegraph station or instal or work any apparatus for wireless telegraphy in any place in the Colony or on board any British ship registered in the Colony except under and in accordance with a license granted in that behalf by the Governor.

(2) Every such license shall be in such form and for such period as the Governor in Council may determine, and shall contain such terms, conditions and restrictions on and subject to which the license is granted as the Governor shall consider desirable in the public interest.

5. (1) If any person establishes a wireless telegraph station without a license in that behalf or instals or works any apparatus for wireless telegraphy without a license in that behalf he shall be liable to a fine not exceeding one thousand dollars or to imprisonment of either description for a term not exceeding twelve months, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Ordinance except with the previous sanction of the Public Prosecutor.

(2) If a magistrate is satisfied by information on oath that there is reasonable ground for believing that a wireless telegraph station has been established without a license in that behalf or that any apparatus for wireless telegraphy has been installed, or worked in any place or on board any ship within the jurisdiction without a license in that behalf he may grant a search-warrant to any police officer to enter and inspect the station, place or ship and to seize any apparatus which appears to him to be used or intended to be used for wireless telegraphy therein.

6. (1) The Governor in Council may make regulations for all or any of the following matters:—

(i) For prescribing the form and manner in which applications for licenses under this Ordinance are to be made;

(ii) for prescribing the fees payable on the grant of any license;

(iii) for regulating the manner in which apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Colony shall be worked so as to prevent interference with naval signalling or the working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the waters thereof, and so as not to interrupt or interfere with the transmission of any wireless messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea;

(iv) for prohibiting, except with the special or general permission of the Postmaster-General of the Colony, the working or using of any apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, whilst such ship is in any of the harbours of the Colony;

(v) for prohibiting or regulating in case at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy on board merchant ships, whether British or foreign, in the waters of the Colony, the use of wireless telegraphy on board such ships while in such waters by such further rules as the Governor may see fit to make from time to time, and either in all cases or in such cases as may be deemed desirable.

(2) Provided that no regulations made in respect of the matters described in paragraphs (iii) (iv) and (v) of this section shall apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

7. When an applicant for a license proves to the satisfaction of the Governor that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy a license for that purpose shall be granted, subject to such special terms, conditions and restrictions as the Governor may think proper, but shall not be subject to any rent or royalty.

8. (1) Every omission or neglect to comply with and every act done or attempted to be done contrary to the provisions of this Ordinance or of any Regulation made thereunder, or in breach of the conditions and restrictions subject to or upon which any license has been issued shall be deemed to be an offence against this Ordinance, and for every such offence not otherwise specially provided for the offender shall, in addition to the forfeiture of any article seized, be liable to a fine of five hundred dollars.

(2) All convictions, forfeitures and fines under this Ordinance or any Regulations made thereunder may be had and recovered before a district court.

REGULATIONS.

B The following Regulations, dated January 5th, 1914, were made under the "Wireless Telegraphy Ordinance, 1912":—

1. All apparatus for wireless telegraphy on board a merchant ship whether British or foreign in the waters of the Colony shall be worked in such a way as not to interfere with (a) Naval signalling, or (b) the working of any wireless telegraph station lawfully established, installed, or worked in the Colony or the waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship whether British or foreign shall be worked or used whilst such ship is in any of the harbours of the Colony except with the special or general permission of the Postmaster-General of the Colony.

3. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships whether British or foreign while in the waters of the Colony shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

THE WIRELESS TELEGRAPHY ORDINANCE, 1912.

REGULATIONS UNDER.

C In exercise of the powers conferred by section 6 of the Wireless Telegraphy Ordinance, 1912, the Governor in Council is pleased to make the following regulations:—

1. All apparatus for wireless telegraphy on board a merchant ship, whether British or foreign, in the waters of the Colony shall be worked in such a way as not to interfere with (a) Naval signalling, or (b) the working of any wireless telegraphy station lawfully established, installed, or worked in the Colony or the waters thereof, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship whether British or foreign shall be worked or used whilst such ship is in any of the harbours of the Colony, except with the special or general permission of the Postmaster-General of the Colony.

3. If at any time, in the opinion of the Governor, an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, the use of the wireless telegraphy on board merchant ships whether British or foreign while in the waters of the Colony shall be subject to such further rules as may be made by the Governor from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable.

4. These Regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

5. The Regulations made on the 30th December, 1918, and published as Notification No. 5 in the *Gazette* of the 3rd January, 1919, are hereby cancelled.

E. C. H. WOLFF,
Clerk of Councils.

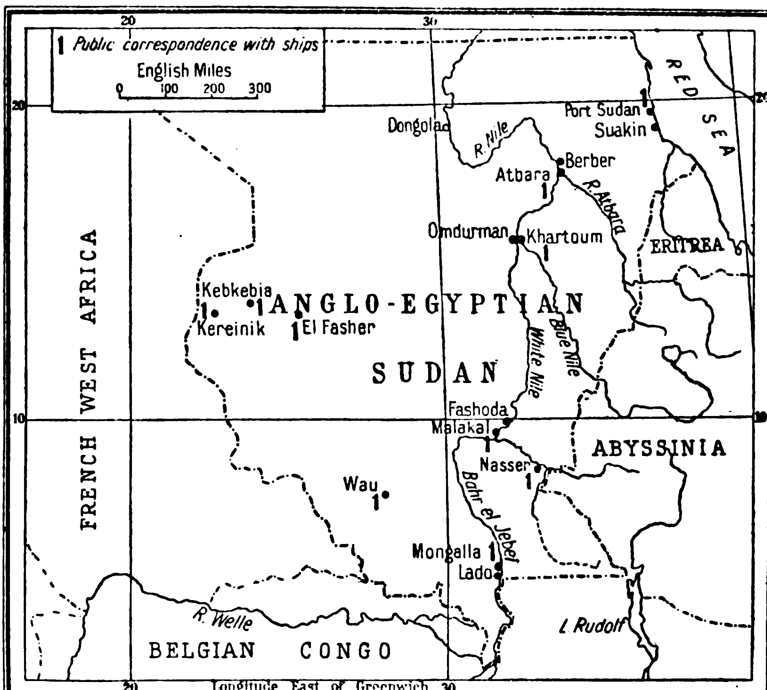
SUDAN

THE immense territory known by the above name covers approximately 985,000 square miles and is situated immediately to the south of Egypt proper. It formed the locale of the war against the Khalifa in 1896–99, when the late Earl Kitchener overthrew this oppressive rebel and restored the country to a state of security and comparative peace. The population of the Sudan is approximately 3½ millions. By a convention between the Egyptian and British Governments, signed at Cairo on January 19th, 1899, the administration of the territory south of the 22nd parallel of N. latitude lies in the hands of a Governor-General appointed by Egypt with the assent of Great Britain. All ordinances, laws and regulations are made by the Governor-General in Council.

CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Post and Telegraph Dept.—		
Lieut.-Col. J. P. Moir, D.S.O., R.E.	Director of Posts and Telegraphs	G.P.O., Khartoum
Mr. H. B. Sayer	Deputy Assistant Director for Wireless Duties	G.P.O., Khartoum
Superintending Engineers' Dept. (Wireless Section)—		
Staff-Sergt. W. Finding, R.E.	Wireless Inspector Mechanic	G.P.O., Khartoum
Mr. H. A. Woolidge ..	Wireless Inspector Mechanic	G.P.O., Khartoum



The wireless inspectors act as superintendents of groups of stations. The other personnel at the stations consist of European foreman engineers where possible in charge of groups of stations, native telegraphmasters and assistants, and native engine drivers and assistants.

ORGANISATION.

The first wireless installation in the Sudan was fitted at Port Sudan in the beginning of 1915, the first three inland stations, including those at Malakal and Gambela, being fitted in the autumn of the same year.

None of the stations is at present fitted with apparatus suitable for communication with aircraft. When the C.W. set at Khartoum approaches completion, the stations at Malakal and Mongalla, and subsequently the others, will be fitted with an alternative apparatus for receiving C.W. signals, but will still retain their spark transmission.

None of the stations transmits time, weather or meteorological signals.

ADMINISTRATION.

The Regulations affecting Radiotelegraphy in the Sudan are carried out under an Ordinance issued by the Governor-General, and dated at Khartoum, June 4th, 1906. No special regulations have been issued in pursuance of the Ordinance of 1906, and the service is conducted under the Provisions of the International Radiotelegraph Convention, 1912, and the Regulations for its execution. No licenses for private wireless stations have hitherto been issued.

A—Wireless Telegraph Ordinance.

AN ORDINANCE FOR CONSTITUTING WIRELESS TELEGRAPHY A MONOPOLY OF GOVERNMENT.
No. 2 of 1906.

A This Ordinance may be cited as "The Wireless Telegraph Ordinance, 1906."

No person shall instal or make use of any apparatus for Wireless Telegraphy or transmit or receive messages by means of any such apparatus within the Sudan except the Department of Telegraphs or a duly authorised officer or official of the Sudan Government, unless such person is in possession of a special license in writing from the Governor-General.

SWEDEN

(See map on p. 418.)

THE territory of the Kingdom of Sweden includes the eastern and main part of the Scandinavian peninsula. In the extreme north and north-east Norway and Finland are her neighbours. The border on the Finnish frontier is the Torne Elf, a river running from north to south, and falling into the northern end of the Gulf of Bothnia. Norway lies on the west of Sweden; and the Kiel, a chain of highland plateaux and mountains, forms the natural boundary thereof. The Kattegat to the south-west and the Baltic in a southerly and easterly direction separate her from the European continent.

The length of the country is estimated to be 2,500 kilometres from 69° north to 55° south latitude, and the size 450,600 square kilometres. Population about 6 millions.

Sweden is a constitutional monarchy. The Parliament consists of two chambers, of which the second chamber is directly elected by the people, and the first by the municipalities, in a somewhat indirect way.

The Cabinet is appointed by the King, and is supposed to be backed by a Parliament majority. The constitution rests on the fundamental law of 1809, revised in 1865.

CONTROL.

Wireless telegraphy, except in so far as the Navy is concerned, has been placed in the hands of the Kungliga Telegrafstyrelsen, which is a body under the supervision of the Minister of Communication and of which the Radio Bureau forms a special department.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. W. Murray	Minister of Communications	Stockholm
Mr. Sven Ludvig Herman Rydin	Director-General (Head of the Kungliga Telegrafstyrelsen)	Do.
Mr. S. Ljungqvist	Chief of Radio Bureau	Do.
Mr. A. S. Litström	Inspector of Wireless Installations	Do.
Mr. J. G. Holmström	Director of Radiotelegraphic Instruction	Do.

The first land station in Sweden was organised and owned by the Swedish Navy. At present five land stations belong to the Royal Swedish Telegraph Administration, two to the Swedish Navy, one to the State Railways, and two stations established on lightships to the Royal Pilot Administration.

On January 1st, 1919, the Swedish Government took over permanently all wireless telegraphy in Sweden and on board Swedish merchant ships. Hitherto, the Société Anonyme Internationale de Télégraphie sans Fil in Brussels, controlling the Marconi as well as the Telefunken patents in Sweden, had a virtual monopoly in the Mercantile Marine, but by means of a friendly arrangement between the Swedish Government and the S.A.I.T., the former have acquired the patent rights of the latter.

No private companies, societies or individuals are permitted to work wireless telegraphy or erect stations without a concession from the Government. There are no wireless clubs or societies.

ORGANISATION.

Wireless telegraphy was first employed by the Swedish Navy in 1902, and was at the same time installed on the fortresses near Vaxholm, off Stockholm, on the Baltic coast. Wireless rapidly developed in the Navy, and only a few years after the first trials every ship was equipped. In 1904 a ship station and shore station were built in Karlskrona, but some years elapsed before wireless was introduced into the Mercantile Marine. In 1910 the s.s. *St. Paul*, of Gothenburg, was fitted with a Marconi installation, and soon afterwards there was much wireless activity amongst Swedish shipowners, so that by the end of 1921 some 200 ships of the Mercantile Marine were carrying wireless.

For ship and shore traffic there are stations at Boden, Göteborg, Hernosand, Karlskrona, Gottland, and at Vaxholm, near Stockholm. An important 50-kilowatt station has been erected near Karlsborg.

Wireless stations for aviation purposes have not yet been established. Meteorological and Press services are sent out, more especially for Swedish ships. Experiments with direction finding stations have been going forward for some time, and a station was opened at Vinga on November 15th last. It is controlled by Göteborg which latter is addressed for requests for position.

LIST OF INSTALLATIONS.

Land stations for public traffic to ships	6
Land stations for restricted public traffic	4
Ship stations on Government vessels	44
Ship stations on privately owned vessels	200

ADMINISTRATION.

Wireless telegraphy and telephony are controlled by the Act of August 31st, 1907, the Royal Decree of May 13th, 1921, and the Statute 514 of December 23rd, 1915, concerning the equipment of vessels:—

A—Act of August 31st, 1907.
B—Royal Decree of May 13th, 1921.
C—Extract from Statute 514 of December 23rd, 1915.
D—Form of License.
E—Agreement between Denmark, Norway and Sweden regarding expeditious forwarding of radiotelegrams, (see Norway).

ACT OF AUGUST, 31st, 1907.

A CONCERNING THE ESTABLISHMENT AND WORKING OF INSTALLATIONS OF RADIOTELEGRAPHY AND RADIO-TELEPHONY.

1. Whosoever desires to establish in Sweden, on land or on board a vessel permanently moored in Swedish waters, an electric installation of radiotelegraphy or radiotelephony for public or private use must apply for an authorisation from the King.

2. The authorisation of the King must likewise be applied for, by any person or persons desiring to establish on board a Swedish vessel other than permanently moored, an installation of the kind referred to in Paragraph 1.

3. The authorisation granted by the King as prescribed in paragraphs 1 and 2, can only be granted for a certain period. In granting the authorisation, His Majesty prescribes under the reservation of private rights, the manner and conditions under which the installation may be established and worked.

4. Whosoever establishes or works, without the authorisation of the King or contrary to the provisions prescribed in the authorisation, an installation within the meaning of the present law, is liable to a fine of from 25 to 1,000 kronen if the penalty incurred by this contravention is not included in the Penal Code.

5. If an installation within the meaning of the present law has been established without the authorisation of the King, or contrary to the provisions prescribed simultaneously with the authorisation, or if the authorisation has been revoked later by the King, it is the duty of the Governors of Provinces to take the necessary steps to prevent any use being made of the installation.

6. Every fine imposed under the present law reverts to the State. Fines not paid on account of the insolvency of the delinquent are expurgated by terms of imprisonment as prescribed in the Penal Code.

7. The provisions of this law do not apply to State installations.

8. All regulations and all dispositions concerning foreign vessels not permanently moored in Swedish waters, which may be considered necessary for the proper working in Sweden of installations within the meaning of the Act, are made by the King.

ROYAL DECREE OF MAY 13th, 1921.

B ROYAL DECREE CONCERNING THE WORKING OF RADIOTELEGRAPHIC AND RADIOTELEPHONIC INSTALLATIONS ESTABLISHED ON BOARD FOREIGN VESSELS.

Given at the Palace of Stockholm on May 13th, 1921.

I, Gustave, by the grace of God, King of Sweden, of the Goths and Vendes, make known that on the representation which has been made to us, we hereby repeal the Decree of June 20th, 1913 (No. 125), concerning the working in the Kingdom of radiotelegraphic and radiotelephonic installations established on board foreign vessels, as well as the Decree of September 4th, 1916 (No. 375), concerning the conditions to be observed by those working in Swedish territorial waters, radiotelegraphic or radiotelephonic installations established on board merchant vessels, which Decrees are replaced henceforward by the following dispositions, decreed on account of the clause inserted at Section 8 of the law of August 31st, 1907 (No. 94), relative to the establishment and working of radiotelegraphic and radiotelephonic installations.

1. Radiotelegraphic or radiotelephonic installations established on board foreign vessels, not stationary in the territorial waters of Sweden are called in the present decree radio installations on board foreign vessels.

2. (i) Radio installations on board foreign vessels must not be used in the vicinity of Swedish ports, without special authorisation to this effect, given by the "Director-General of Telegraphs" in conjunction with the "Chief of the Admiralty," and under reservation of a strict observation of the detailed regulations prescribed by the "Director-General of Telegraphs."

(ii) In the latitude of the territorial waters of Sweden, which are situated at a lesser distance than ten nautical miles of a Swedish coast station the radio installations on board foreign vessels must not be used except in case of distress or in order to communicate to the coast urgently.

(iii) The "Director-General of Telegraphs" must be able, after having arranged to this effect with the "Chief of the Admiralty," to suspend or restrict, except in case of distress, the use of radio installations on board of foreign vessels, even should it be proceeding by other latitudes of the territorial waters of Sweden than those stated in Section 2, para (ii).

3. The Director-General of Swedish Telegraphs has power to issue any necessary regulations concerning the putting out of use of radio installations on board of foreign vessels found in a latitude where conforming to the regulations of Section 2 it is forbidden to use such an installation.

4. The Director-General of Telegraphs will make known to navigators in the way that he judges best the regulations and rules decreed in Section 2, para. (iii), as well as those in Section 3 of the present law, once and for all time, for a certain time, or for some particular case. The said Director will also solicitate the Director of the Administration of Pilotage, the Director-General of Customs, the Departmental Authorities making inspections, and the services subordinate to them respectively, the strict observance of the laws and regulations decreed.

5. When a radio installation on board a foreign vessel is used in the territorial waters of Sweden it must, unless otherwise ordered, conform to the instructions given in the Radio Telegraphic Convention in force with the service rules attached thereto.

6. All infringements of the regulations of the present law or the regulations and orders decreed by the Director-General of Telegraphs in virtue of the same law will be punished by a fine of 25 to 1,000 crowns.

7. The offences shown in Section 6 will be dealt with by the agents of the Civil Administration.

For the competent jurisdiction in the matter of these offences the parties implicated must conform to the rules of Section 328 of the Maritime Code.

The fines imposed on the offenders in this matter will be taken by the Crown. The fines of which the amount would not be paid on account of the insolvency of the delinquent will be commuted in accordance with the penal code.

8. The regulations of Sections 6 and 7 herein described are not applicable to warships.

The present law will enter into force on June 1st, 1921.

In faith of which, etc.
Made at the Palace of Stockholm on May 13th, 1921.

(Signed)
(L.S.)
(Witnessed)

(Minister of Communications.)

EXTRACT FROM SWEDISH STATUTES, 1915.

No. 514 of 23rd December.

C

Fifth Chapter.
Equipment of Vessels.

I.—Wireless Telegraph Installation.

Art. 56.

Vessels which must be provided with wireless installation.—Vessels which are used for voyages between different countries or between a country and any of its colonies, possessions or protectorates, shall be equipped with wireless telegraph installation, provided however—

That such installation shall not be required if the vessel has fewer than 50 persons on board or if although the number on board is 50 or over, this is exclusively due to the fact that the master, by reason of sickness among the crew or through other compelling, unforseen circumstances, has been obliged to supplement the crew, or has saved persons in distress at sea, or by reason of obligation, according to law, has taken with him seamen or other persons;

And that the Board of Trade may, on application, grant exemption from the obligation of having such installation, if the Board, in view of the route or other circumstances concerning the voyage, finds that such installation is not necessary and if such application concerns:—

(*a*) Vessels which do not go out to a distance of more than 150 nautical miles from the nearest coast;

(*b*) Vessels which only in exceptional cases and incidentally have 50 persons or more on board for the reason that they take stowers or stowage labourers with them on a certain part of the voyage and which on the one hand do not sail from one continent to another, and on the other hand are, during the said part of the voyage, between 30° northern and 30° southern latitude; or

(*c*) Sailing vessels which are of rather primitive construction and which it is practically impossible to equip with wireless installation.

Art. 57.

Concession and classes of vessels.—Concerning H.M.'s permission to carry out such installation as referred to in Art. 56, separate enactments have been issued.

In sanctioning such installation as aforesaid the King will fix the class in which the vessel shall be classified, in accordance with the nature of the attendance of the wireless telegraph station.

Art. 58.

Range of the installation.—The wireless installation shall be sufficiently powerful to be able to transmit in day-time, under normal conditions, signals which can be clearly distinguished at a distance of at least 100 nautical miles from the vessel.

Art. 59.

Spare installation.—Vessels which are to be equipped with wireless installation shall have a spare wireless plant. This shall be placed wholly and entirely in the upper parts of the vessel, as high up as possible, and all its parts shall be fitted up so as to be protected as much as possible.

The spare plant shall have a source of power which is exclusively intended for the spare plant, and which can be brought into action most speedily.

The source of power referred to in the second paragraph of this article shall be capable of acting for at least six hours with a minimum range of 80 nautical miles in the case of vessels, for which uninterrupted attendance of the wireless installation shall have been provided, and of 50 nautical miles in the case of any other vessel.

If the main installation meets the requirements of the first and second paragraphs hereof as regards the spare plant the spare installation shall not be required.

LICENSE.

D

Form of License for Ship Stations.
License.

Delivered in view of the opening of communication ....
of the radiotelegraphic station installed with the permission of the King on....(date)........
on board the Swedish vessel ....
belonging to the Port of ....

The Royal Administration of Swedish Telegraphs certifies by these presents that as the result of the inspection instituted to this effect, the radiotelegraphic station above mentioned ....(system).............. fulfils the conditions cited in conformity with the regulations of the International Radio-Telegraphic Convention for the "Safety of Life at Sea" actually in force, relative to the station on board the.................... class
Stockholm............(date)..........192 .

....
The Director-General of Swedish Telegraphs.

....

....

Supplementary inspection made 19.. : ....
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SWITZERLAND

THE Swiss Confederation is made up of the union of twenty-five separate political entities, or republics, organised into twenty-two cantons.

The area comprises 15,976 square miles, the population (according to the census of December 1st, 1920) numbers 3,880,320. The country extends from 45° 0′ to 48° 0′ north latitude, its longitude lying between 5° 0′ and 11° 0′ east of Greenwich. The length from north to south is 137 miles,

the width from east to west 216 miles; the furthest points on its boundary are 223 miles apart.

The first Federal Organisation dates from September 12th, 1848, and the present Constitution came into force on May 29th, 1874. Supreme authority is exercised by the Federal Assembly, which consists of two Councils —the *Ständerath* or State Council, and the *Nationalrath* or National Council. The latter, which represents the Swiss people in its totality, consists of triennially elected members, each member representing a population of 20,000. The Ständerath (consisting of forty-four Deputies) represents the cantons, each canton contributing two members.

Both Chambers unite to elect the Federal Assembly, which wields the supreme authority and higher executive of the Confederation.

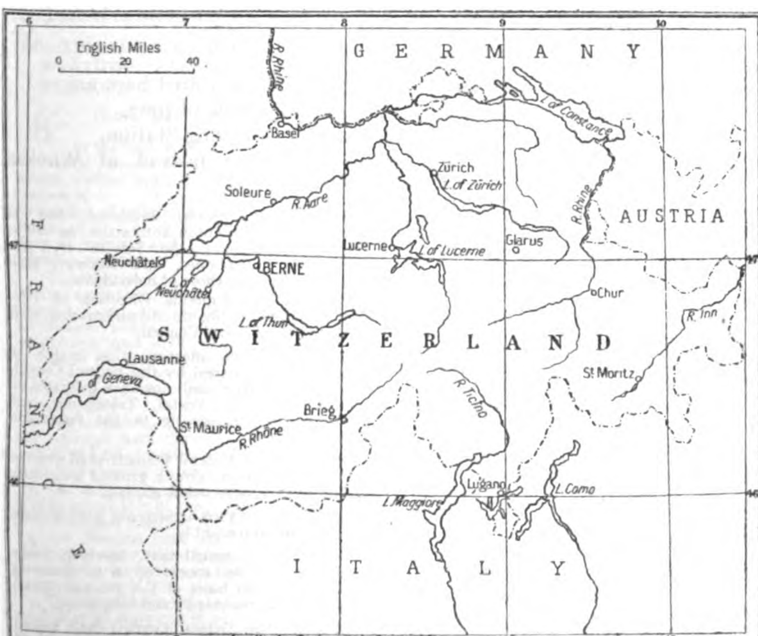
CONTROL.

Wireless telegraphy in Switzerland is controlled by the Department of Posts, Telegraphs and Railways, but there is no special branch of the department devoted thereto.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Dr. R. Haab	Head of the Department of Posts, Telegraphs and Railways	Berne
Dr. R. Furrer	Director-General of Posts, Telegraphs and Telephones	Berne
M. Hauser	Assistant to the Director-General	Berne
E. Nussbaum	Engineer of Telegraphs	Berne

Wireless telegraphy is a State monopoly, based on the general Federal Law affecting telegraphs and telephones, of December 16th, 1907, of which we print below the apposite clauses.



Licenses are, however, granted for receiving stations only, available for a limited period, where these are to be used solely for the reception of time, weather signals, and general and technical instruction and scientific researches. We append the form of such contracts.

ORGANISATION.

At the outbreak of the late war the Federal Council prohibited the erection of new wireless stations, and revoked all existing licenses for utilising receiving stations. These private installations were accordingly forthwith dismantled, their apparatus being confiscated and stored by the Telegraph and Telephone Department. By way of compensation, the Federal Council decided, for the benefit of the dispossessed licenses, to carry out the clause of the International Confederation of October 25th, 1913, relative to an international time association. An Order in Council of September 14th, 1920, definitely revoked this prohibition, and the installations have been returned to their owners.

Starting with August 1st, 1916, the International Time Signal radiated from the Eiffel Tower is on working days telephonically transmitted by the Telegraph and Telephone Department at Berne to subscribers residing in Switzerland.

The Federal Council, on March 11th, 1921, granted a concession to Marconi's Wireless Telegraph Co. to establish and work an up-to-date wireless station with valve transmission of 25 kw. This station is worked by the "Marconi Radio Station, S.A.," constituted as a Swiss Société Anonyme for the purpose.

It is situated near the village of Münchenbuchsee 7·35 km. north of Berne, at an altitude of 580 m. The geographical position is lat. 47° 0′ 52″ long. 7° 26′ 37″ E. of Greenwich.

The station will be opened for public service on January 1st, 1922, and will work on a wavelength of 3,400 m.

ADMINISTRATION.

The texts of the ruling Laws and Regulations reprinted here are :—

A—The Federal Telegraph and Telephone Law of 1907.

B—The License for Time and Weather Receiving Station.

C—Federal Decree establishing Telephonic instead of Wireless Reception of International Time Signals.

FEDERAL LAW REGULATING THE ORGANISATION OF TELEGRAPHIC AND TELEPHONIC ADMINISTRATION.

(Dated December 16th, 1907.)

CHAPTER I.

ART. 1.—The right to establish and exploit any form of electrical telegraph and telephone in Switzerland, or to issue licenses for any such apparatus is vested solely in the Confederation.

ART. 2.—Localities whose commercial, industrial, or political status warrants the establishment of telegraphic or telephonic stations shall contribute their just quota towards the expense of such establishment.

Subject to appeal to the Federal Council the Telegraph and Telephone Administration shall decide the matter of installation and extent of the facilities granted. The Federal Council shall specify the rules governing the subvention and guarantees to be given by communities and individuals.

ART. 3.—The right of usage of such facilities shall be common to all. No special privilege with regard to fees or priority of transmission or reception shall be granted to any.

Nevertheless, official communications of the Federal and Canton authorities, as well as messages concerning the Service of Posts, Telegraphs, Telephones, and Railways shall have priority over those of individuals.

ART. 4.—The Supreme Direction of Telegraphic and Telephonic Administration shall belong to the Federal Council.

All regulations affecting this branch of service shall be issued by the Federal Council, so far as the latter shall not have delegated its authority to the Postal, Telegraphic, and Railway Departments or to the responsible officials thereof.

ART. 5.—The Federal Council shall conduct all negotiations concerning general telegraphic and telephonic agreements abroad.

Ratification of such agreements must be made by the Federal Assembly.

The Federal Council may, however, finally ratify agreements concluded with bordering countries on the basis of the general conventions affecting telegraphy and telephony.

ART. 6.—The Federal Council shall appoint all telegraphic and telephonic officials and employees. The nomination of individual

employees or fixed classes of employees may however be delegated to the Postal and Railway Department or to the Managing Director of Telegraphs and Telephones.

Art. 7.—The immediate superintendence of all the administration of telegraphs and telephones is delegated to the Postal and Railway Department which is moreover entrusted with the necessary executive power.

Chapter II.

This chapter contains Articles 8, 9, and 10, which enumerate the classes of chief officials.

Chapter III.

This chapter is concerned with the organisation of telegraphic and telephonic zones and the offices and officials to be established in connection therewith. It contains Articles 11 to 16 inclusive.

Chapter IV.

Herein are laid down (in Article 17) the classification and maximum salaries of chief officials.

Chapter V.

In this chapter we find Articles 18 to 22 embodying the general rules applying to the nomination basis of appointment and responsibilities of the various officials.

Chapter VI.

This chapter covers Articles 23 and 24 and concerns itself with offences and penalties. It also includes Article 25 enumerating the previous decrees abolished by this law and Article 26 the formal Direction of Issue.

PROVISIONAL LICENSE FOR TIME AND WEATHER RECEIVING WIRELESS STATIONS.

B There is hereby granted to of in the canton of a Provisional License to make use of a receiving wireless station which shall be installed in the premises of as well as for the erection of an antenna composed of strands of metres length, between the aforesaid premises and on the following conditions:

1. The erection and upkeep, with all that thereto appertains, shall be carried out in accordance with the regulations laid down by the Federal Council with regard to electric installations, and shall be carried out at the expense of the licensee, who shall have, moreover, to come to an understanding with the corporations or individuals whose property must be hired.

2. The installations granted must not in any way interfere with the working and development of the telegraphic and telephonic systems of the State and/or of the railway companies.

3. The oscillating circuit must be constructed so as to be capable of exact and definite adjustment to a fixed length of wave.

4. The licensee must conform to the rules with regard to wireless telegraphy, which may be laid down, from time to time, by the Federal authorities.

5. The installation granted under this license must be at all time and in every part accessible to representatives of the administration of telegraphs and telephones entrusted with the duty of control.

6. The installation shall only be used for the reception of time signals. Any other employment thereof (for instance, exchange of messages with radiotelegraphic stations in Switzerland or outside its frontiers, as well as the communication of any signals that may be received, or of their tenor, to third parties) will be considered as a violation of the rights of the confederation (see the provisions of Articles 23 and 24 of the Federal Law of December 16th, 1907, dealing with the organisation and administration of telegraphs and telephones).

7. When changes of any importance have to be made in the installation, or when its location has to be shifted, or if it is to be worked by any other person, the licensee is required to immediately advise the administration of telegraphs and telephones concerning the change.

8. The present license may be withdrawn at any time and for any period, and this may be done without conferring the right to any indemnity. In such an event the whole installation must be displaced at the cost of the licensee within fifteen days from the period fixed for the expiry of the license.

9. The licensee shall be responsible for any loss or expense incurred by the Federal administration in consequence of failure to carry out the terms of the present license.

10. The licensee shall pay to the Administrator of Telegraphs and Telephones a fixed fee of five francs payable at the Central Local Telegraph Centre of to defray the inspection and to cover the cost of registering the license.

Given at Berne the day of 19

I/We, the undersigned, after having acquainted myself/ourselves with the conditions and stipulations hereinabove set forth, declare myself/ourselves willing to accept them and abide by them.

The day of 19 .
(Signed)

TELEPHONIC TIME SIGNAL SERVICE.

Section A.

C Decree of the Federal Council dated July 21st, 1916.

The Swiss Federal Council, acting on the suggestion of its Postal and Railway Department, and in view of the Federal decision of March 27th, 1914, decrees:

1. That the international radiotelegraphic time signal radiated daily at 10.56 and at 11 o'clock (H.E.C.) from the Paris Observatory by the Eiffel Tower Station, shall be—during working days—retransmitted telephonically by the Administration of Swiss Telegraphs and Telephones at Berne.

2. Any regular telephone subscriber may take up a subscription to the telephonic time signal, arranging therefor with his telephone exchange.

3. Subscriptions are monthly or annual, and are valid for the civil month or civil year.

The rates of subscription are:

(*a*) Fr.2.50 per month, or part of a month.
(*b*) Fr.25 per year.

For ten months at least they must be paid in advance.

4. Over and above the possibility of regular subscriptions, telephone subscribers may arrange to be supplied with odd time-service messages on such circuits as receive them. Each separate

message will be charged for at the rate of 20 centimes, and this fee will be included, with ordinary conversation charges, in the monthly account.

5. The Administrator of Telegraphs and Telephones will accept no responsibility with regard to any irregular working of the Telephonic Time-Signal Service; nevertheless every endeavour will be made to assure and develop the service.

6. If any interruption in telephonic transmission of the time-signal last for more than seven consecutive days, without this arising from any fault on the part of the subscriber, the subscription fee will be refunded proportionately to the duration of the interruption.

7. Every effort shall be made to carry this edict into effect on and from the 1st August, 1916.

The Postal and Railway Department shall take steps to carry this out.

Dated Berne, 21st July, 1916.

SECTION B.

Method of Administration.

1. Every telephone subscriber who desires to subscribe to the Telephonic Time-Signal Service must address a written request to his telephone exchange showing exactly what kind of subscription he desires to take up (see Article 4 of this section, paragraphs (*a*) to (*c*)).

2. The telephone exchange which receives an application for such a subscription may, under this rule, accede to the application immediately.

On the reception of a first request for a subscription, the Telephone Exchange puts itself immediately in touch either with the Central Station through whose intermediary the time signal will be sent, or with its own local centre.

3. The originals of all applications for subscription must be sent to the Chief Office, through the intermediary of the local centres.

4. (*a*) The fees for annual subscriptions must be paid in advance for December, together with the half-yearly fees for the ordinary telephone service.

For periods of less than ten months, starting with the first day of the subscription and until the end of the year, the tax is collected on the basis of the tariff applicable to monthly subscriptions.

An annual subscription becomes automatically renewed from year to year, and may be cancelled at any time upon giving eight days' notice. If, however, it has not run for at least ten months, counting from the beginning of the year up to the date of cancellation, the rate of tax applicable is that of a monthly subscription.

(*b*) Fees for monthly subscriptions for a settled period (temporary subscriptions) are payable in advance, and for the whole duration of the subscription.

In default of advice to the contrary on the part of the subscriber, his subscription is considered as cancelled on the expiry of the agreed period.

(*c*) Monthly subscriptions of indeterminate duration are renewed automatically month by month. They may be cancelled at the end of a month by notice given at least eight days in advance; the subscription fees being payable monthly and in advance.

(*d*) Requests for reception of odd time-service messages are only granted in the case of lines of some importance, and on condition that they are made at latest by 10.50 a.m. Applicants are rung up at 10.55 a.m.

Applications are noted by entering the number of the subscriber on tickets specially prepared for this purpose. These tickets serve as the basis for the rendering of accounts.

When it has not been possible to attend to an application, because the subscriber's line was engaged his enquiry is charged as a local conversation. Fees for odd time-signal messages are charged for at the end of each month on the same invoice as conversation charges.

5. Subscription rates and charges made for odd time-signal messages come under subsection 2(*c*) of the accounts for messages, and must in consequence be entered, duly classified (see Article 4 of section (*a*) above) on Form No. 600 under "Other Receipts."

6. The commission allowed to exchange proprietors attached to central stations of Class III, and of intermediary stations, who have to co-operate in the telephonic time-service amounts to 25 per cent. on receipts. This commission is taken into consideration when, the annual telephone accounts are adjusted.

Time-service communications in transit should be recorded in the same way as ordinary conversations in transit.

7. When the time-signal message is transmitted to an intermediary station linked up with a central station of Class III, the latter has only a right to a commission of 2 cents per communication in transit, and the commission of 25 per cent. on the message is allotted to the proprietor of the intermediary station.

TAHITI

(See FRANCE.)

TASMANIA

(See AUSTRALIA.)

TONGA ISLANDS

(See PACIFIC ISLANDS.)

TONQUIN

(See FRANCE.)

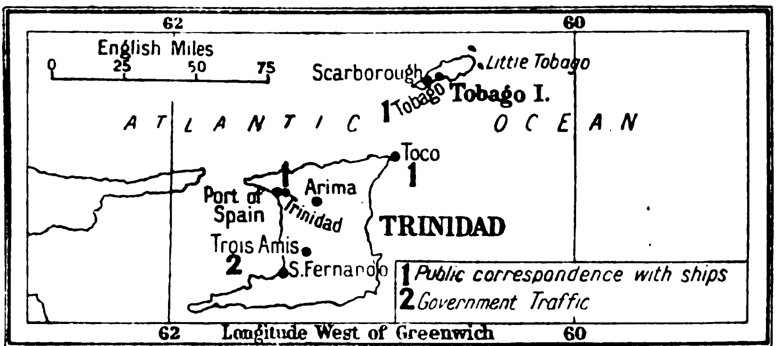
TRINIDAD AND TOBAGO

THE Colony of Trinidad and Tobago includes the island of Trinidad, which is about 69 miles long by 52 miles wide, with an area of 1,754 square miles, and the island of Tobago, which is about 26 miles long and 7½ miles wide, with an area of 114 square miles.

Trinidad is situated about 10° north of the Equator, between 61° and 62° west longitude, and Tobago is to the north-east of Trinidad, about 11° 9′ north latitude and 60° 12′ west longitude. They form a Crown Colony, and their government is administered by a Governor, assisted by an Executive Council and Legislative Council.

CONTROL AND ORGANISATION.

The first wireless station in Trinidad was erected in 1905 at the north-western corner of the island to obtain a direct sea line with Tobago, and merely to bring Tobago into telegraphic communication with Trinidad and thus with the outer world. It was a 2-kw. Lodge-Muirhead station. Subsequently this station was removed, and a 5-kw. Marconi station was erected in Port of Spain, with a daylight range of about 350 nautical miles and 1,000 nautical miles at night. Public ship and shore service is maintained therewith.



Trois Amis closed.

The Tobago station is on Fort King George, east of Scarborough, the capital of Tobago, and is a 3-kw. station (Marconi and Lodge-Muirhead), with a daylight range of about 350 nautical miles, and about 600 nautical miles at night.

The Trinidad and Tobago stations are open day and night for commercial service. There are no relaying charges between the two stations, and if ships are unable to obtain communication with Trinidad they endeavour to communicate with Tobago.

The Trinidad and Tobago Government Wireless Service is a branch of the Public Works Department and under the control of the Director of Public Works. The senior officers of the Wireless branch of the Public Works Department are as follows :—

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official	*Title.*	*Address.*
C. M. Cross, A.M.I.R.E.	O.C. Wireless Station	Trinidad and Tobago
L. W. Pouchet, A.M.I.R.E. ..	Chief Operator	Trinidad
A. E. Wilson	Second Operator	Tobago

ADMINISTRATION.

The Law and Regulations governing radiotelegraphy are reprinted below :—

A—Ordinance No. 6 of 1917.
B—Regulations.

ORDINANCE No. 6 of 1917.

ISSUED MAY 8TH, 1917.

A Be it enacted by the Governor of Trinidad and Tobago with the advice and consent of the Legislative Council thereof as follows :—

1. This Ordinance may be cited as the Wireless Telegraphy Ordinance, 1917.

2. (1) It shall not be lawful for any person to use or establish in this Colony any apparatus or installation for the purposes of wireless telegraphy, without first obtaining from the Governor a license in that behalf, to be granted on such terms and conditions as the Governor may from time to time prescribe.

(2) Any person contravening the provisions of this section is liable on summary conviction before a Magistrate to a fine not exceeding £50 or to imprisonment with or without hard labour, for any term not exceeding six months, and the apparatus and installation in respect of which a conviction is obtained may by order of the convicting magistrate be forfeited to the use of His Majesty the King.

3. (1) No person shall work any apparatus for wireless telegraphy installed on any merchant ship whilst that ship is in the territorial waters of the Colony, otherwise than in accordance with regulations made in that behalf by the Governor in Executive Council.

(2) Such regulations shall be published in the *Royal Gazette*.

(3) Any person contravening, or permitting, procuring, or assisting in the contravention of, any such regulation is liable, on summary conviction before a magistrate, to a penalty not exceeding £50, or to imprisonment, with or without hard labour, for any term not exceeding six months.

4. Any person who unlawfully and maliciously :—

(*a*) Injures, removes or destroys any apparatus or installation for the purpose of wireless telegraphy, or any part of such apparatus or installation ; or

(*b*) Obstructs or prevents in any manner whatsoever the sending, conveyance or delivery of any message or signal by wireless telegraphy ;

is guilty of a misdemeanour and is liable to imprisonment, with or without hard labour, for any term not exceeding two years.

5. The Wireless Telegraph Ordinance (No. 236) and the Wireless Telegraphy Ordinance 1909 are hereby repealed.

Passed in Council this twenty-seventh day of April, in the year of Our Lord one thousand nine hundred and seventeen.

REGULATIONS MADE UNDER THE WIRELESS TELEGRAPHY ORDINANCE, 1917.

B 1. All apparatus for wireless telegraphy on board a merchant ship in the territorial waters of the Colony shall be worked in such a way as not to interfere with (*a*) Naval signalling or (*b*) the working of any wireless telegraph station lawfully established, installed or worked in the Colony or the territorial waters thereof, and in particular the said apparatus shall be worked so as not to interrupt or interfere with the transmission of any messages between the wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

2. No apparatus for wireless telegraphy on board a merchant ship shall be worked or used whilst such ship is in any of the harbours of the Colony, except with the special or general permission in writing of the Director of Public Works of the Colony. Such special or general permission shall only be given to any ship subject to the condition that it shall not exchange signals with another ship except on the private business of the owners.

3. If at any time in the opinion of the Governor an emergency has arisen in which it is expedient for the public service that His Majesty's Government shall have control over the transmission of messages by wireless telegraphy, the use of wireless telegraphy on board merchant ships whilst in the territorial waters of the Colony shall be subject to such further rules as may be made by the Governor in Executive Council.

4. These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering the signals of distress.

5. The regulations made under the Wireless Telegraphy Ordinance, 1917, on the 5th day of July, 1917, are hereby revoked.

Made by the acting Governor in Executive Council this 12th day of June, 1919.

TRIPOLI

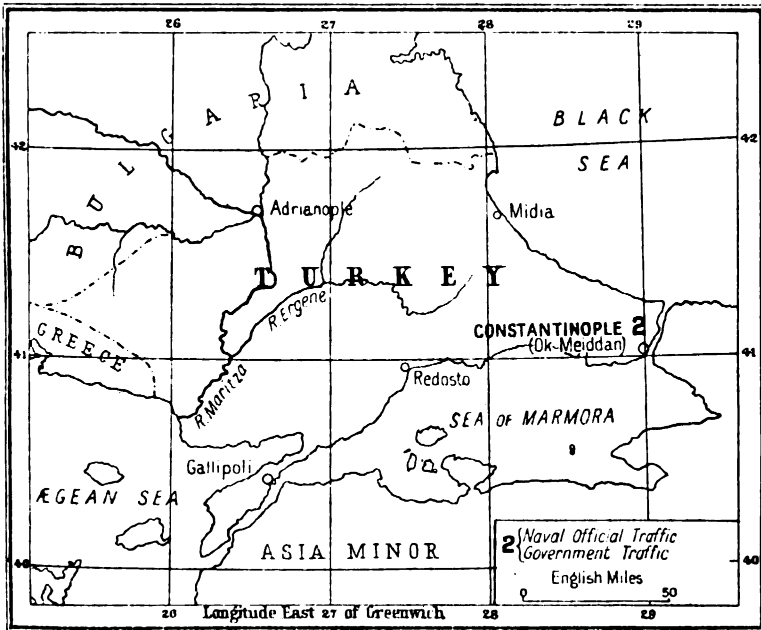
(See ITALY.)

TUNIS

(See FRANCE.)

TURKEY

STABLE conditions in the Ottoman Empire are not yet re-established sufficiently to enable us to obtain any information in regard to radiotelegraphy and telephony in that country, but we hope, in our next volume,



to print the full text of any laws and regulations which have been published in the interim. As far as is known, there is one station for Government traffic only.

CONTROL.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. Réfik Halid ..	Director-General of Posts, Telegraphs and Telephones	Constantinople

UGANDA PROTECTORATE

UGANDA came under British dominion in 1890, and a portion of the territories was for a time administered by the Imperial British East African Company. The northern boundary is limited by the Sudan, the eastern by Kenya Colony, the western by the Belgian Congo, and the southern by Tanganyikan territory.

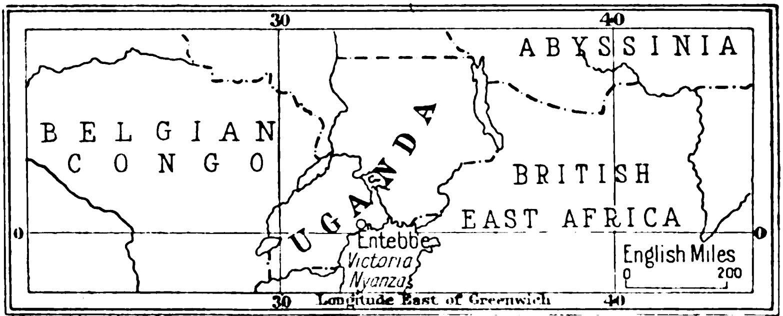
The administrative centre is Entebbe, the native capital of Uganda being Mengo, Kampala. Nile steamers from Khartoum ply to Rejaf. The Uganda Railway which runs from Kisumu on Victoria Nyanza to Mombasa on the coast of East Africa, lies entirely within the territory known as Kenya Colony and Protectorate.

The administration is conducted by a Governor and Commander-in-Chief, assisted by an Executive and Legislative Council.

CONTROL.

OFFICIAL CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. W. G. Tucker ..	Telegraph Engineer	Entebbe
Mr. R. Rabson ..	Assistant Telegraph Engineer	Do.



ADMINISTRATION.

Wireless telegraphy is administered under the following :—

ORDINANCE.

1. This Ordinance may be cited as "The Wireless Telegraphs Ordinance, 1908."

2. No person shall use or establish any apparatus or installation for the purpose of operating wireless telegraphs without a license from the Governor.

Any person contravening the terms of this section shall be liable on conviction to a fine not exceeding Rs. 1,500 or imprisonment of either kind for a term not exceeding twelve months, and any apparatus or installation in respect of which an offence under this section is committed may be forfeited and sold or disposed of as the Governor may direct.

3. It shall be lawful for the Governor from time to time by rules to prescribe the terms and conditions upon which licenses to use or establish apparatus or installations for the purpose of operating wireless telegraphs may be granted.

UNION OF SOUTH AFRICA

(See SOUTH AFRICA, UNION OF.)

UNITED KINGDOM

(See GREAT BRITAIN.)

UNITED STATES OF AMERICA

THE declaration of independence of the States of the American Union was adopted by Congress, July 4th, 1776. The Constitution of September 17th, 1787, lays down the basis of government under which (modified by amendments in 1787, 1791, 1798, 1804, 1865, 1868, 1870 and 1913) this great and powerful Republic is now governed.

The Union comprises 48 STATES, each of which is provided with a Legislature of two Houses, a Governor at the head of the Executive and a judicial system. The district of Columbia (D.C.) is the seat of the Federal Government, and was provided by the State of Maryland for this purpose in 1791. It is co-extensive with the City of Washington, and embraces an area of 60 miles. The TERRITORIES of Alaska and Hawaii are governed by local Legislatures, whose Acts may be modified or annulled by Congress. The grand total of the superfices governed under the U.S.A. Constitution amounts to 3,574,658 square miles.

N.B.—There are, moreover, DEPENDENCIES administered by the U.S.A. Government. Their rule is undertaken by a Governor and staff appointed by the President. Porto Rico and the Philippines belong to this division, although provided with Representative Government. Guam, in the Marianne Archipelago (Pacific Ocean), and the Samoan Islands are pure Dependencies administered by the U.S. Navy Department. Wireless in all these instances is controlled by the Navy Department in war time, but in peace time the radio stations of Porto Rico, Hawaii and Alaska are under the jurisdiction of the Department of Commerce, and all commercial transmitting radio stations operated in these dependencies must be licensed by this Department, and the operators of such stations must also be licensed.

The " CANAL ZONE " on the Isthmus of Panama ranks as a Dependency, but it has been judged best to print the wireless particulars relating thereto separately under the heading " Panama—Canal Zone."

CONTROL.

The Congress of the United States has delegated to the Department of Commerce the duty of the enforcement of the Wireless Communication Laws and the International Radio-telegraph Convention, and the work is handled through the Bureau of Navigation, Washington.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Officials.	*Title.*	*Address.*
Navy—		
Rear-Admiral Marbury-Johnson, U.S.N.	Director of Naval Communications ..	Washington
Army—		
Maj.-Gen. Sir G. O. Squier, K.C.M.G ..	Chief Signal Officer	Washington
Commerce —		
Mr. Herbert Hoover	Secretary of Commerce	Washington
Mr. C. H. Huston..	Assistant Secretary of Commerce ..	Washington
Mr. E. T. Chamberlain	Commissioner of Navigation	Washington
Mr. A. J. Tyrer	Deputy Commissioner of Navigation ..	Washington
Mr. W. D. Terrell	Chief Radio Inspector	Washington

There are, in addition, twenty-one inspectors and assistant inspectors, stationed at various districts established by the Bureau of Navigation.

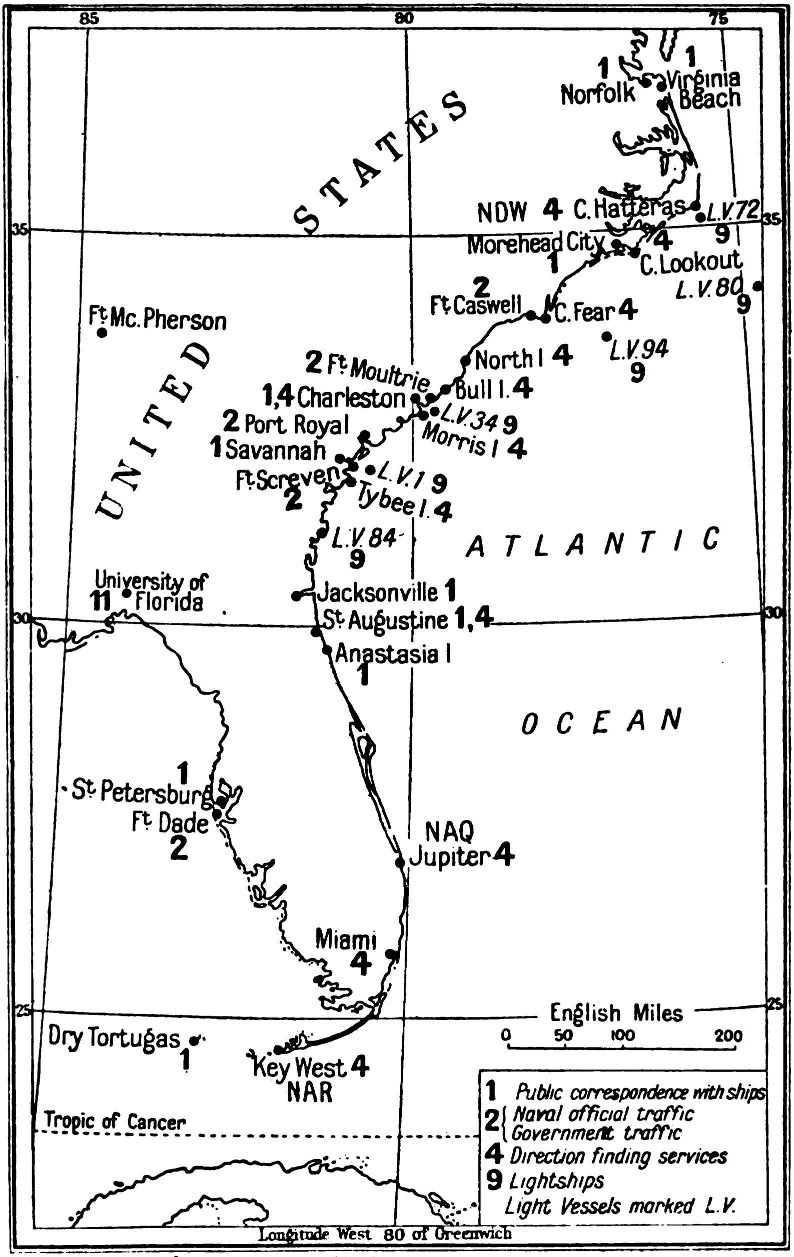
ORGANISATION.

In September and October, 1899, Senatore (then Mr.) Marconi installed a radio station for the purpose of reporting the International yacht races between the yachts *Shamrock* and *Columbia*. The *New York Herald* of October 1st, 1899, tells how wireless was used for sending bulletins from the steamships *Ponce* and *Grande Duchesse*, which followed the contending yachts.

According to the most reliable information obtainable, the first regularly operated radio stations in the United States were at Siasconset (Nantucket), Mass., and on Nantucket Shoals Lightship No. 66, work on which was started early in the summer of 1901. These stations were not experimental, or demonstrational, or temporary stations, but were erected for the particular purpose of providing for the regular daily transmission of ship news, and for regular communication and exchange of messages with vessels equipped with similar apparatus. They were owned and operated by the *New York Herald*, and were equipped with Marconi apparatus purchased from, and installed by, the English Marconi Company.

The *New York Herald* of August 17th, 1901, contained an account of how the first radiotelegraphic station at Siasconset got into communication by wireless with the Nantucket Shoals Lightship. The latter, on August 16th, received from the s.s. *Lucania*, of the Cunard Line, at a distance of 72 miles, the first connected wireless message ever radiated to the United States from an approaching vessel. That message ran, " All well on board."

In 1899 (the same year as that of the first wirelessly reported yacht races) the matter of establishing radio services in the TERRITORY of


85
80
75
35
30
25
UNITED STATES
ATLANTIC
OCEAN
1 Norfolk
1 Virginia Beach
NDW 4 C. Hatteras
L.V. 72 9
Morehead City 1
4
C. Lookout
L.V. 80 9
2 Ft Caswell
C. Fear 4
L.V. 94 9
Ft Mc. Pherson
North I 4
2 Ft Moultrie
Bull I. 4
1,4 Charleston
L.V. 34 9
Morris I 4
2 Port Royal
1 Savannah
Ft Screven 2
L.V. 1 9
Tybee I. 4
L.V. 84 9
University of Florida 11
Jacksonville 1
St Augustine 1,4
Anastasia I 1
1 St Petersburg
Ft Dade 2
NAQ Jupiter 4
Miami 4
Dry Tortugas 1
Key West 4 NAR
English Miles
0 50 100 200
Tropic of Cancer
1 Public correspondence with ships
2 { Naval official traffic / Government traffic
4 Direction finding services
9 Lightships
Light Vessels marked L.V.
Longitude West 80 of Greenwich

HAWAII was receiving official attention. It was not until March 1st, 1901, however, that radio stations on the island were opened for business, the apparatus being supplied with power by Marconi induction coils. On October 15th, 1908, a 10-kw. station was erected at Kahuku Point, in Oahu (Hawaii) and at that time this was probably the most powerful station on the Pacific. Uninterrupted night communication was established with the wireless station on Telegraph Hill, San Francisco, California, a distance of 2,100 miles. This constituted the first direct radio communication between Hawaii and the U.S.A. On April 1st, 1915, a wireless service was established between the station at Wahiawa, Oahu (Hawaii), and the United States Naval Station at Tuluila, Samoa (2,400 miles distant). A composite system of equipment was used, with a transformer input of 6-kw., and a reliable nightly service has been maintained ever since.

In the TERRITORY of ALASKA radio communication takes the place of wired telegraph and telephone services. The large fish-canning companies rely almost exclusively upon their radio installations for communication between their canning plants, and for the maintenance of touch with their vessels engaged in this industry. Static interference (or atmospherics) is practically unknown there.

The number of wireless stations (excluding amateur installations) licensed in the United States at June 30th, 1921, totalled 3,557.

At June 30th, 1920, the *Government* shore wireless stations numbered 135, of which eighty-eight are in continental United States, twenty in Alaska, nineteen in the Philippines, three in the Canal Zone, two in Hawaii, and one each in Puerto Rico, Guam and Samoa. The *Government* ship stations total 470.

Considerable meteorological services are given under the control of the Department of Agriculture, Weather Bureau, in co-operation with the Office of Communication of the Navy Department. An extensive Hydrographic and Time service is dealt with by the Naval Department.

There are fourteen Air Mail Radio Stations used in connection with the mail services of the Post Office Department.

In practically every city of any size in the United States there are one or more radio clubs, composed of men interested in radiotelegraphy from a scientific standpoint, practical radio men, and amateur radio experimenters.* The most important of these clubs is the Institute of Radio Engineers (particulars regarding which may be obtained from the Year-Book published in New York by the Institute).

ADMINISTRATION.

In 1910 an effort to regulate radio communication in the United States was made, when a Bill was prepared and passed by the Senate. It was not reached on the House of Representatives calendar, and therefore did not become effective.

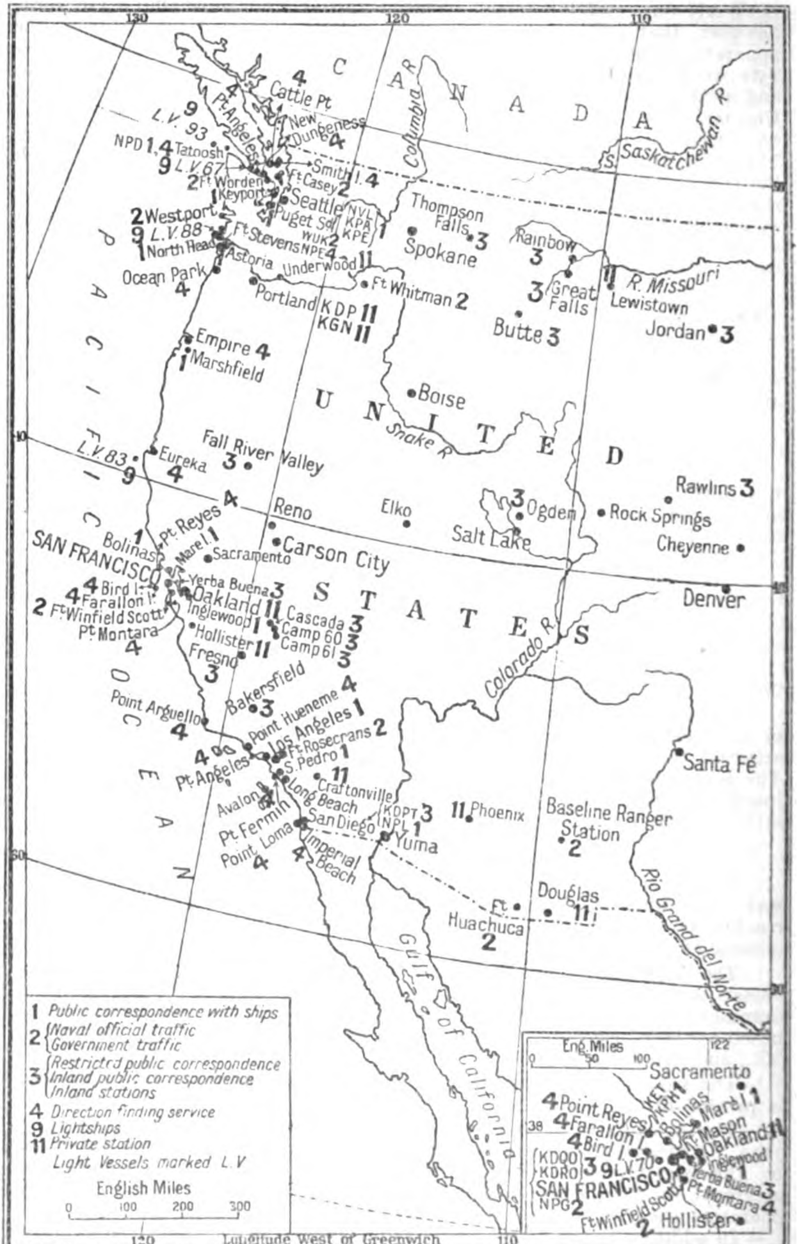
The first Act requiring radioapparatus on certain passenger-carrying vessels was approved June 24th, 1910. Under this Act the Secretary of Commerce and Labour organised on July 1st, 1911, the radio service, composed of three inspectors, with headquarters at New York, N.Y., Baltimore, Md., and San Francisco, Cal.

The second Act, approved July 23rd, 1912, amended the above Act and is printed below.

The Act to regulate radio communication was approved August 13th, 1912. Under this Act transmitting stations and radio operators are licensed by the Secretary of Commerce. Transmitting stations are inspected to ascertain whether they comply with the requirements of the law. Radio operators are examined in order to determine their qualifications.

In addition to the above-mentioned Acts, the Department also enforces

* For a list of the principal Clubs and Societies see Amateur section of this volume.


1 Public correspondence with ships
2 Naval official traffic
Government traffic
3 Restricted public correspondence
Inland public correspondence
Inland stations
4 Direction finding service
9 Lightships
11 Private station
Light Vessels marked L.V
English Miles
0 100 200 300
Longitude West of Greenwich
CANADA
UNITED STATES
PACIFIC OCEAN
Gulf of California
Columbia R.
S. Saskatchewan R.
R. Missouri
Snake R.
Colorado R.
Rio Grand del Norte
Cattle Pt
Pt. Angeles
New Dungeness
L.V. 93
NPD 1,4 Tatoosh
9 L.V.67
2 Ft Worden
1 Keyport
Smith I. 4
Ft Casey 2
Seattle
Puget Sd
NVL KPA KPE
WUK 2
2 Westport
9 L.V.88
1 North Head
Ft Stevens NPE 4
Astoria
Underwood 11
Ocean Park 4
Portland
KDP 11
KGN 11
Ft Whitman 2
Thompson Falls 3
Spokane
Rainbow 3
3 Great Falls
Lewistown
Butte 3
Jordan 3
Empire 4
Marshfield
Boise
L.V.83
9
Eureka 4
Fall River Valley 3
Reno
Elko
3 Ogden
Salt Lake
Rock Springs
Rawlins 3
Cheyenne
Denver
Pt Reyes 4
Bolinas 1
Mare I. 1
Sacramento
Carson City
SAN FRANCISCO
4 Bird I.
4 Farallon I.
2 Ft Winfield Scott
Pt Montara 4
Yerba Buena 3
Oakland 11
Inglewood 1
Cascada 3
Camp 60 3
Camp 61 3
Hollister 11
Fresno 3
Bakersfield 3
Point Arguello 4
Point Hueneme 4
Los Angeles 1
Ft Rosecrans 2
S. Pedro 1
11
Pt Angeles 4
Avalon
Craftonville
Long Beach
Pt Fermin
San Diego
Point Loma 4
Imperial Beach 4
KDPT 3
NPL 1
Yuma
11 Phoenix
Baseline Ranger Station 2
Santa Fé
Douglas 11
Ft Huachuca 2
Eng. Miles
0 50 100
Sacramento
4 Point Reyes
KET KPH 1
Bolinas
Mare I. 1
4 Farallon I.
4 Bird I.
Ft Mason
Oakland 11
KDQO KDRO 3
9 L.V.70
Inglewood 1
SAN FRANCISCO
NPG 2
Yerba Buena 3
Pt Montara 4
Ft Winfield Scott 2
Hollister

the London International Radiotelegraphic Convention rules of 1912, to which the United States is a party.

On March 4th, 1913, the Act abolishing the Department of Commerce and Labour and creating the Department of Commerce and the Department of Labour became effective. The enforcement of the radio laws was placed under the jurisdiction of the Secretary of Commerce.

The items published in the following pages are :—

A—Act of July 23rd, 1912.
B—Act of August 13th, 1912.
C—Regulations, 1912.
D—Regulations governing Ship and Land Radio Stations (as amended April 15th and May 1st, 1920).
E—Regulations governing Radio Operators.
F—General Information.
G—Certificate of Radio Inspection.
H—Master's Certificate of Radio Apparatus.
I—Radio Declaration, Form 753a.
J—Master's Certificate, Clearance Form 753b.
K—License for General Public Service Coast Radio Station.
L—License for Ship Radio Station.
M—License for Land Radio Station.
N—License for Amateur Radio Station.
O—License to Radio Operator, Commercial Extra First Grade.
P—License to Radio Operator, Commercial Grade.
Q—License to Radio Operator, Amateur First Grade.
R—License to Radio Operator, Amateur Second Grade.
S—Notice to Berne Bureau.
T—Act concerning International Communication.
U—United States Radio Compass Stations.
V—Public Resolution No. 48, dated June 5th, 1920.

A An Act approved July 23rd, 1912, amending section 1 of an Act entitled "An Act to require apparatus and operators for radio communication on certain ocean steamers," approved June 24th, 1910.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. . . .

"Sec. 1. That from and after October first, nineteen hundred and twelve, it shall be unlawful for any steamer of the United States or of any foreign country navigating the ocean or the Great Lakes and licensed to carry, or carrying, fifty or more persons, including passengers or crew or both, to leave or attempt to leave any port of the United States unless such steamer shall be equipped with an efficient apparatus for radio communication, in good working order, capable of transmitting and receiving messages over a distance of at least one hundred miles, day or night. An auxiliary power supply, independent of the vessel's main electric power plant, must be provided which will enable the sending set for at least four hours to send messages over a distance of at least one hundred miles, day or night, and efficient communication between the operator in the radio room and the bridge shall be maintained at all times.

"The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars.

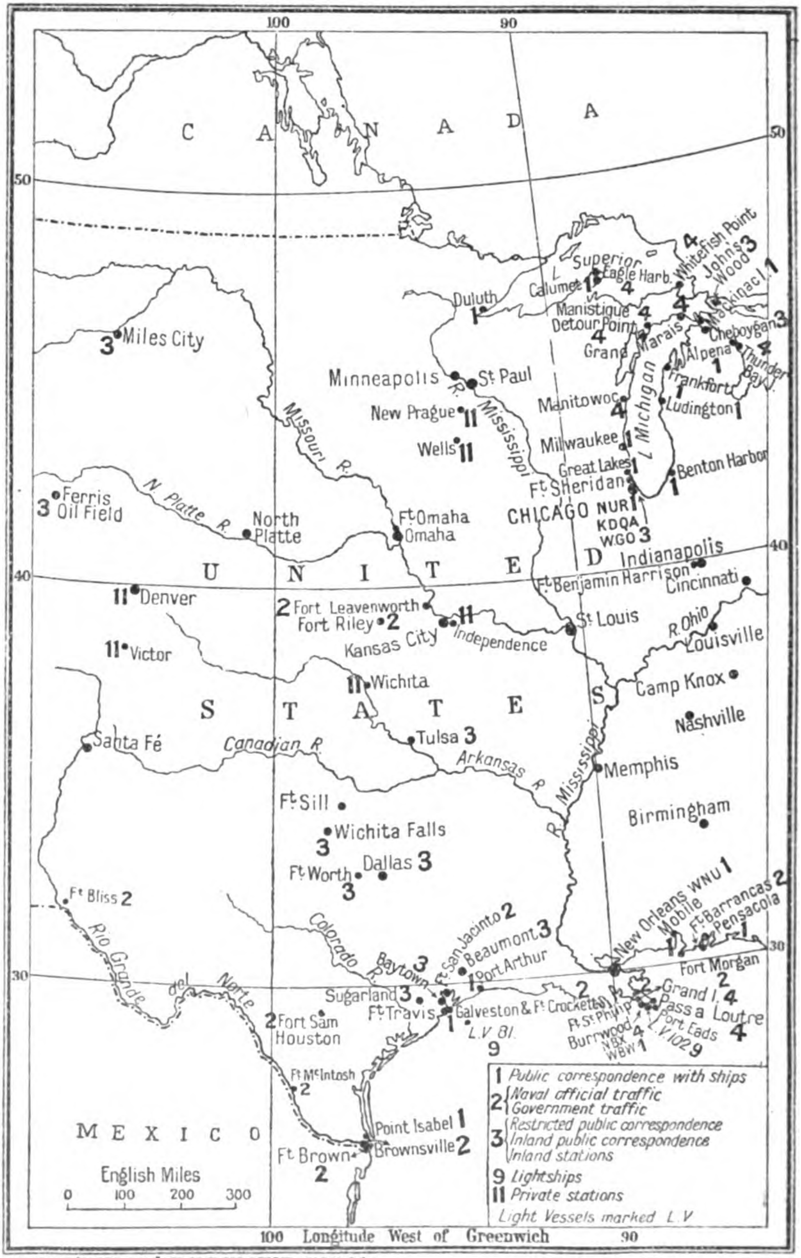
"That the provisions of this section shall not apply to steamers plying between ports, or places, less than two hundred miles apart."

Sec. 2. That this Act, so far as it relates to the Great Lakes, shall take effect on and after April first, nineteen hundred and thirteen, and so far as it relates to ocean cargo steamers shall take effect on and after July first, nineteen hundred and thirteen : *Provided*, That on cargo steamers, in lieu of the second operator provided for in this Act, there may be substituted a member of the crew or other person who shall be duly certified and entered in the ship's log as competent to receive and understand distress calls or other usual calls indicating danger, and to aid in maintaining a constant wireless watch so far as required for the safety of life.

The remaining sections of the Act of June 24th, 1910, which are unchanged, read as follows :—

Sec. 2. That for the purpose of this Act apparatus for radio communication shall not be deemed to be efficient unless the company installing it shall contract in writing to exchange, and shall, in fact, exchange, as far as may be physically practicable, to be determined by the master of the vessel, messages with shore or ship stations using other systems of radio communication.

Sec. 3. That the master or other person being in charge of any such vessel which leaves or attempts to leave any port of the United States in violation of any of the provisions of this Act shall, upon conviction, be fined in a sum not more than five thousand dollars, and



CANADA
UNITED STATES
MEXICO
L. Superior
L. Michigan
Missouri R.
R. Mississippi
N. Platte R.
Canadian R.
Arkansas R.
R. Ohio
Colorado R.
Rio Grande del Norte
3 Miles City
Duluth 1
Minneapolis
St. Paul
New Prague 11
Wells 11
Calumet 1
Eagle Harb. 4
Whitefish Point 4
Johns Wood 3
Mackinac I. 1
Manistique 4
Detour Point 4
Grand Marais
Cheboygan 3
Alpena 1
Thunder Bay 4
Frankfort 1
Ludington 1
Manitowoc 4
Milwaukee 1
Great Lakes 1
Ft. Sheridan 1
Benton Harbor 1
CHICAGO NUR KDQA WGO 3
3 Ferris Oil Field
North Platte
Ft. Omaha
Omaha
Indianapolis
Ft. Benjamin Harrison
Cincinnati
11 Denver
2 Fort Leavenworth
Fort Riley 2
Kansas City
11 Independence
St. Louis
Louisville
11 Victor
11 Wichita
Camp Knox
Nashville
Santa Fé
Tulsa 3
Memphis
Ft. Sill
Wichita Falls 3
Birmingham
Ft. Worth 3
Dallas 3
Ft. Bliss 2
New Orleans WNU 1
Mobile 1
Ft. Barrancas 2
Pensacola 1
Ft. San Jacinto 2
Beaumont 3
Baytown 3
Port Arthur 1
Sugarland 3
Ft. Travis
Galveston & Ft. Crockett 1
L.V. 81 9
2
Fort Morgan 2
Grand I. 4
Pass a Loutre 4
Ft. St. Philip
Port Eads
L.V. 102 9
Burrwood NBX 4 WBW 1
2 Fort Sam Houston
Ft. McIntosh 2
Point Isabel 1
Ft. Brown 2
Brownsville 2
English Miles
0 100 200 300
1 Public correspondence with ships
2 Naval official traffic; Government traffic
3 Restricted public correspondence; Inland public correspondence; Inland stations
9 Lightships
11 Private stations
Light Vessels marked L.V
100 Longitude West of Greenwich 90

any such fine shall be a lien upon such vessel, and such vessel may be libelled therefor in any district court of the United States within the jurisdiction of which such vessel shall arrive or depart, and the leaving or attempting to leave each and every port of the United States shall constitute a separate offence.

SEC. 4. That the Secretary of Commerce shall make such regulations as may be necessary to secure the proper execution of this Act by collectors of customs and other officers of the Government.

B

AN ACT TO REGULATE RADIO COMMUNICATION.

APPROVED AUGUST 13TH, 1912.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a person, company or corporation within the jurisdiction of the United States shall not use or operate any apparatus for radio communication as a means of commercial intercourse among the several States, or with foreign nations, or upon any vessel of the United States engaged in interstate or foreign commerce, or for the transmission of radiograms or signals the effect of which extends beyond the jurisdiction of the State or Territory in which the same are made, or where interference would be caused thereby with the receipt of messages or signals from beyond the jurisdiction of the said State or Territory, except under and in accordance with a license, revocable for cause, in that behalf granted by the Secretary of Commerce upon application therefor; but nothing in this Act shall be construed to apply to the transmission and exchange of radiograms or signals between points situated in the same State: Provided, That the effect thereof shall not extend beyond the jurisdiction of the said State or interfere with the reception of radiograms or signals from beyond said jurisdiction; and a license shall not be required for the transmission or exchange of radiograms or signals by or on behalf of the Government of the United States, but every Government station on land or sea shall have special call letters designated and published in the list of radio stations of the United States by the Department of Commerce. Any person, company, or corporation that shall use or operate any apparatus for radio communication in violation of this section, or knowingly aid or abet another person, company, or corporation in so doing, shall be deemed guilty of a misdemeanour, and on conviction thereof shall be punished by a fine not exceeding five hundred dollars, and the apparatus or device so unlawfully used and operated may be adjudged forfeited to the United States.

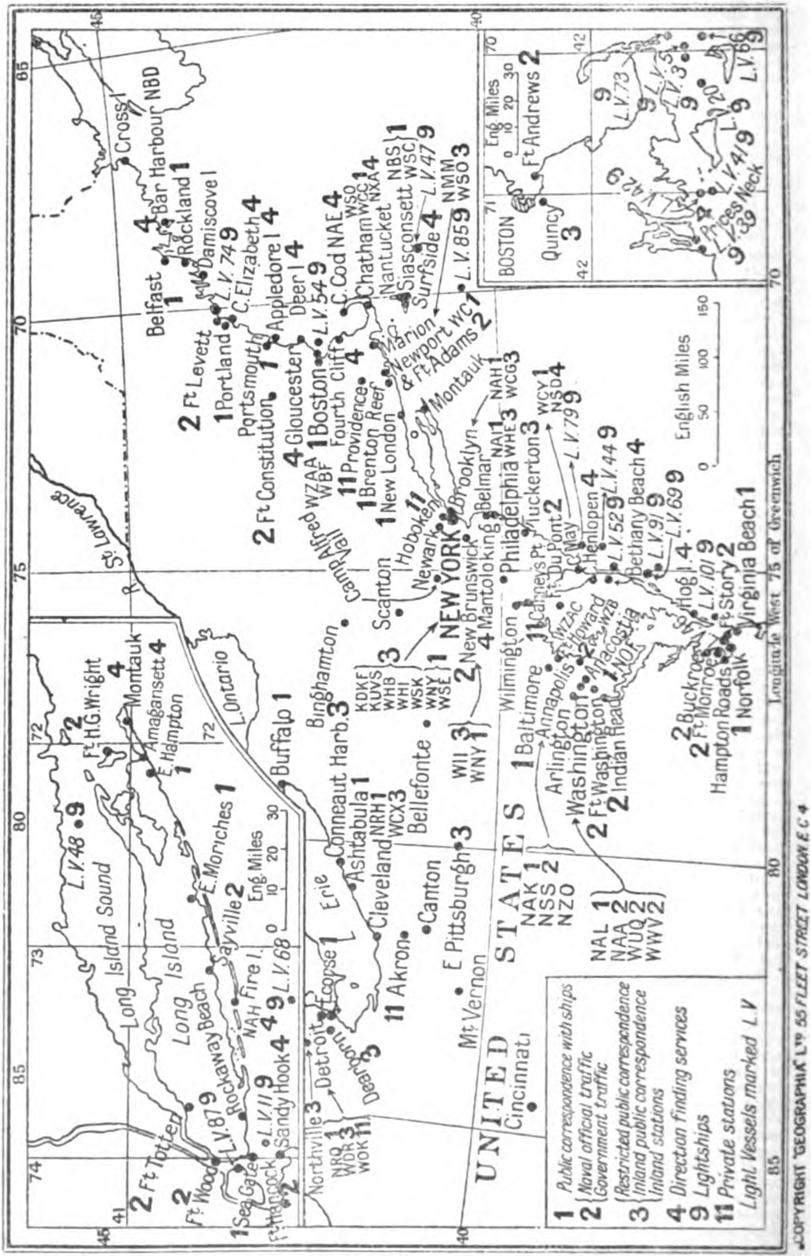
SEC. 2.—That every such license shall be in such form as the Secretary of Commerce shall determine and shall contain the restrictions, pursuant to this Act, on and subject to which the license is granted; that every such license shall be issued only to citizens of the United States or Porto Rico or to a company incorporated under the laws of some State or Territory or of the United States or Porto Rico, and shall specify the ownership and location of the station in which said apparatus shall be used and other particulars for its identification and to enable its range to be estimated; shall state the purpose of the station, and, in case of a station in actual operation at the date of passage of this Act, shall contain the statement that satisfactory proof has been furnished that it was actually operating on the above-mentioned date; shall state the wavelength or the wavelengths authorised for use by the station for the prevention of interference and the hours for which the station is licensed for work; and shall not be construed to authorise the use of any apparatus for radio communication in any other station than that specified. Every such license shall be subject to the regulations contained herein, and such regulations as may be established from time to time by authority of this Act or subsequent Acts and treaties of the United States. Every such license shall provide that the President of the United States in time of war or public peril or disaster may cause the closing of any station for radio communication and the removal therefrom of all radio apparatus, or may authorise the use or control of any such station or apparatus by any department of the Government, upon just compensation to the owners.

SEC. 3.—That every such apparatus shall at all times while in use and operation as aforesaid be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce. Every person so licensed who in the operation of any radio apparatus shall fail to observe and obey regulations contained in or made pursuant to this Act or subsequent Acts or treaties of the United States, or any one of them, or who shall fail to enforce obedience thereto by an unlicensed person while serving under his supervision, in addition to the punishments and penalties herein prescribed, may suffer the suspension of the said license for a period to be fixed by the Secretary of Commerce not exceeding one year. It shall be unlawful to employ any unlicensed person or for any unlicensed person to serve in charge or in supervision of the use and operation of such apparatus, and any person violating this provision shall be guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not more than one hundred dollars or imprisonment for not more than two months, or both, in the discretion of the court for each and every such offence: *Provided*, That in case of emergency the Secretary of Commerce may authorise a collector of customs to issue a temporary permit, in lieu of a license, to the operator on a vessel subject to the radio ship Act of June 24th, 1910.

SEC. 4.—That for the purpose of preventing or minimising interference with communication between stations in which such apparatus is operated, to facilitate radio communication, and to further the prompt receipt of distress signals, said private and commercial stations shall be subject to the regulations of this section. These regulations shall be enforced by the Secretary of Commerce through the collectors of customs and other officers of the Government as other regulations herein provided for.

The Secretary of Commerce may, in his discretion, waive the provisions of any or all of these regulations when no interference of the character above mentioned can ensue.

The Secretary of Commerce may grant special temporary licenses to stations actually engaged in conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours, and under such conditions as will ensure the least interference with the sending or receipt of commercial or Government


UNITED STATES
NEW YORK
Boston
Philadelphia
Washington
Baltimore
L. Ontario
Erie
Long Island Sound
Long Island
St Lawrence
BOSTON
English Miles
Eng. Miles
Longitude West 75 of Greenwich
1 Public correspondence with ships
2 Naval official traffic
Government traffic
3 Restricted public correspondence
Inland public correspondence
Inland stations
4 Direction finding services
9 Lightships
11 Private stations
Light Vessels marked L.V
COPYRIGHT "GEOGRAPHIA" LTD 55 FLEET STREET LONDON E C 4

radiograms, or distress signals and radiograms, or with the work of other stations.

In these regulations the naval and military stations shall be understood to be stations on land.

REGULATIONS.

Normal Wavelength.

1. Every station shall be required to designate a certain definite wavelength as the normal sending and receiving wavelength of the station. This wavelength shall not exceed 600 metres or it shall exceed 1,600 metres. Every coastal station open to general public service shall at all times be ready to receive messages of such wavelengths as are required by the Berlin Convention. Every ship station, except as hereinafter provided, and every coast station open to general public service, shall be prepared to use two sending wavelengths, one of 300 metres and one of 600 metres, as required by the International Convention in force: *Provided*, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservation made by regulations first and second to accord with any international agreement to which the United States is a party.

Other Wavelengths.

2. In addition to the normal sending wave length all stations, except as provided hereinafter in these regulations, may use other sending wavelengths: *Provided*, That they do not exceed 600 metres or that they do exceed 1,600 metres: *Provided further*, That the character of the waves emitted conforms to the requirements of regulations 3 and 4 following.

Use of a "Pure Wave."

3. At all stations if the sending apparatus, to be referred to hereinafter as the "transmitter," is of such a character that the energy is radiated in two or more wavelengths, more or less sharply defined, as indicated by a sensitive wavemetre, the energy in no one of the lesser waves shall exceed 10 per cent. of that in the greatest.

Use of a "Sharp Wave."

4. At all stations the logarithmic decrement per complete oscillation in the wave trains emitted by the transmitter shall not exceed two-tenths, except when sending distress signals or signals and messages relating thereto.

Use of "Standard Distress Wave."

5. Every station on shipboard shall be prepared to send distress calls on the normal wavelength designated by the international convention in force, except on vessels of small tonnage unable to have plants insuring that wavelength.

Signal of Distress.

6. The distress call used shall be the international signal of distress ● ● ● ▬ ▬ ▬ ● ● ●

Use of "Broad Interfering Wave" for Distress Signals.

7. When sending distress signals, the transmitter of a station on shipboard may be tuned in such a manner as to create a maximum of interference with a maximum of radiation.

Distance Requirement for Distress Signals.

8. Every station on shipboard, wherever practicable, shall be prepared to send distress signals of the character specified in regulations 5 and 6 with sufficient power to enable them to be received by day over sea a distance of 100 nautical miles by a shipboard station equipped with apparatus for both sending and receiving equal in all essential particulars to that of the station first mentioned.

"Right of Way" for Distress Signals.

9. All stations are required to give absolute priority to signals and radiograms relating to ships in distress; to cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, to refrain from sending until all signals and radiograms relating thereto are completed.

Reduced Power for Ships near a Government Station.

10. No station on shipboard when within fifteen nautical miles of a naval or military station shall use a transformer input exceeding 1 kw., nor, when within five nautical miles of such a station, a transformer input exceeding ½ kw., except for sending signals of distress, or signals or radiograms relating thereto.

Intercommunication.

11. Each shore station open to general public service between the coast and vessels at sea shall be bound to exchange radiograms with any similar shore station and with any ship station without distinction of the radio systems adopted by such stations, respectively, and each station on shipboard shall be bound to exchange radiograms with any other station on shipboard without distinction of the radio systems adopted by each station, respectively.

It shall be the duty of each such shore station, during the hours it is in operation, to listen-in at intervals of not less than fifteen minutes, and for a period not less than two minutes, with the receiver tuned to receive messages of 300 metre wavelengths.

Division of Time.

12. At important seaports and at all other places where naval or military and private or commercial shore stations operate in such close proximity that interference with the work of naval and military stations cannot be avoided by the enforcement of the regulations contained in the foregoing regulations concerning wavelengths and character of signals emitted, such private or commercial shore stations as do interfere with the reception of signals by the naval and military stations concerned shall not use their transmitters during the first fifteen minutes of each hour, local standard time. The Secretary of Commerce may, on the recommendation of the department concerned, designate the station or stations which may be required to observe this division of time.

Government Stations to Observe Division of Time.

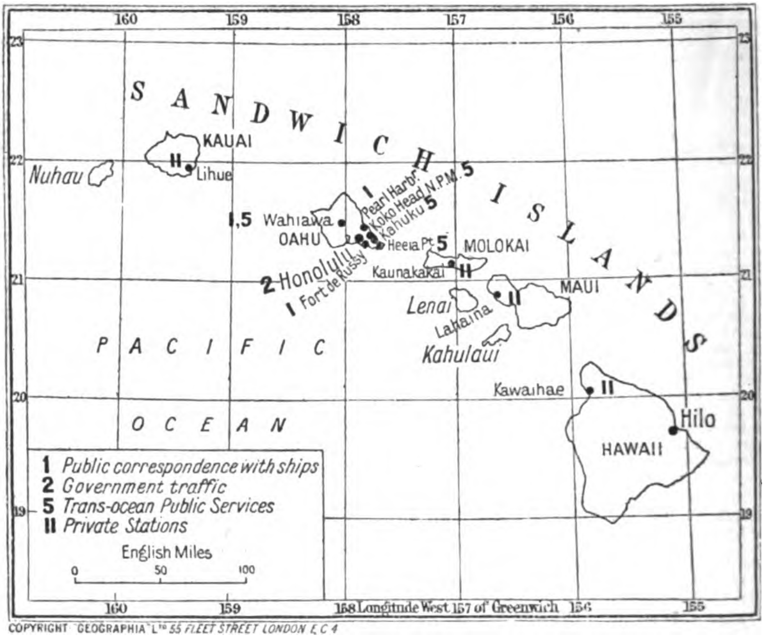
13. The naval or military stations for which the above-mentioned division of time may be established shall transmit signals or radiograms only during the first fifteen minutes of each hour, local standard time, except in case of signals or radiograms relating to vessels in distress, as hereinbefore provided.

Use of Unnecessary Power.

14. In all circumstances, except in case of signals or radiograms relating to vessels in distress, all stations shall use the minimum amount of energy necessary to carry out any communication desired.

General Restrictions on Private Stations.

15. No private or commercial station not engaged in the transaction of bona fide com-



Wahiawa, Honolulu, Fort de Russy and Koko Head closed.

mercial business by radio communication or in experimentation in connection with the development and manufacture of radio apparatus for commercial purposes shall use a transmitting wavelength exceeding 200 metres or a transformer input exceeding 1 kw., except by special authority of the Secretary of Commerce contained in the license of the station: *Provided*, That the owner or operator of a station of the character mentioned in this regulation shall not be liable for a violation of the requirements of the third or fourth regulations to the penalties of one hundred dollars or twenty-five dollars, respectively, provided in this section unless the person maintaining or operating such station shall have been notified in writing that the said transmitter has been found, upon tests conducted by the Government, to be so adjusted as to violate the said third and fourth regulations, and opportunity has been given to said owner or operator to adjust said transmitter in conformity with said regulations.

Special Restrictions in the Vicinities of Government Stations.

16. No station of the character mentioned in regulation 15 situated within five nautical miles of a naval or military station shall use a transmitting wavelength exceeding 200 metres or a transformer input exceeding ½ kw.

Ship Stations to Communicate with Nearest Shore Stations.

17. In general, the shipboard stations shall transmit their radiograms to the nearest shore station. A sender on board a vessel shall, however, have the right to designate the shore station through which he desires to have his radiograms transmitted. If this cannot be done, the wishes of the sender are to be complied with only if the transmission can be effected without interfering with the service of other stations.

Limitations for Future Installations in Vicinities of Government Stations.

18. No station on shore not in actual operation at the date of the passage of this Act shall be licensed for the transaction of commercial business by radio communication within fifteen nautical miles of the following naval or military stations, to wit: Arlington, Virginia; Key West, Florida; San Juan, Porto Rico; North Head and Tatoosh Island, Washington; San Diego, California; and those established or which may be established in Alaska and in the Canal Zone; and the head of the department having control of such Government stations shall, so far as is consistent with the transaction of governmental business, arrange for the transmission and receipt of commercial radiograms under the provisions of the Berlin Convention of 1906, and future International Conventions or treaties to which the United States may be a party, at each of the stations above referred to, and shall fix the rates therefor, subject to control of such rates by Congress. At such stations and wherever and whenever shore stations open for general public business between the coast and vessels at sea under the provisions of the Berlin Convention of 1906 and future International Conventions and treaties to which the United States may be a party shall not be so established as to insure

a constant service day and night without interruption, and in all localities wherever or whenever such service shall not be maintained by a commercial shore station within 100 nautical miles of a naval radio station, the Secretary of the Navy shall, so far as is consistent with the transaction of governmental business, open naval radio stations to the general public business described above, and shall fix rates for such service, subject to control of such rates by Congress. The receipts from such radiograms shall be covered into the Treasury as miscellaneous receipts.

Secrecy of Messages.

19. No person or persons engaged in or having knowledge of the operation of any station or stations, shall divulge or publish the contents of any messages transmitted or received by such station, except to the person or persons to whom the same may be directed or their authorised agent, or to another station employed to forward such message to its destination, unless legally required so to do by the court of competent jurisdiction or other competent authority. Any person guilty of divulging or publishing any message, except as herein provided, shall, on conviction thereof, be punished by a fine of not more than two hundred and fifty dollars or imprisonment for a period of not exceeding three months, or both fine and imprisonment, in the discretion of the court.

Penalties.

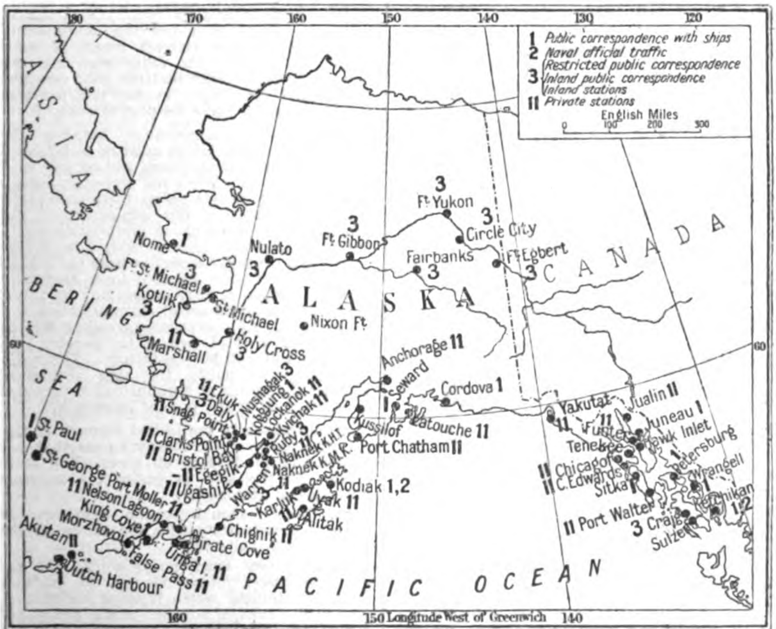
For violation of any of these regulations, subject to which a license under sections 1 and 2 of this Act may be issued, the owner of the apparatus shall be liable to a penalty of one hundred dollars, which may be reduced or remitted by the Secretary of Commerce and for repeated violations of any of such regulations the license may be revoked.

For violation of any of these regulations, except as provided in regulation 19, subject to which a license under section 3 of this Act may be issued, the operator shall be subject to a penalty of twenty-five dollars, which may be reduced or remitted by the Secretary of Commerce, and for repeated violations of any such regulations, the license shall be suspended or revoked.

SEC. 5.—That every license granted under the provisions of this Act for the operation or use of apparatus for radio communication shall prescribe that the operator thereof shall not wilfully or maliciously interfere with any other radio communication. Such interference shall be deemed a misdemeanour, and upon conviction thereof the owner or operator, or both, shall be punishable by a fine of not to exceed five hundred dollars or imprisonment for not to exceed one year, or both.

SEC. 6.—That the expression "radio-communication" as used in this Act means any system of electrical communication by telegraphy or telephony without the aid of any wire connecting the points from and at which the radiograms, signals, or other communications are sent or received.

SEC. 7.—That a person, company, or corporation within the jurisdiction of the United States shall not knowingly utter or transmit, or cause to be uttered or transmitted, any false or fraudulent distress signal or call or false or



fraudulent signal, call, or other radiogram of any kind. The penalty for so uttering or transmitting a false or fraudulent distress signal or call shall be a fine of not more than two thousand five hundred dollars or imprisonment for not more than five years, or both, in the discretion of the court for each and every such offence, and the penalty for so uttering or transmitting, or causing to be uttered or transmitted, any other false or fraudulent signal, call, or other radiogram shall be a fine or not more than one thousand dollars or imprisonment for not more than two years, or both, in the discretion of the court, for each and every such offence.

Sec. 8.—That a person, company, or corporation shall not use or operate any apparatus for radio communication on a foreign ship in territorial waters of the United States otherwise than in accordance with the provisions of sections 4 and 7 of this Act, and so much of section 5 as imposes a penalty for interference. Save as aforesaid, nothing in this Act shall apply to apparatus for radio communication on any foreign ship.

Sec. 9.—That the trial of any offence under this Act shall be in the district in which it is committed, or if the offence is committed upon the high seas or out of the jurisdiction of any particular State or district the trial shall be in the district where the offender may be found or into which he shall be first brought.

Sec. 10.—That this Act shall not apply to the Philippine Islands.

Sec. 11.—That this Act shall take effect and be in force on and after four months from its passage.

D REGULATIONS GOVERNING SHIP AND LAND RADIO STATIONS.

Ship Stations.

1. On vessels coming under the Ship Acts, an emergency power supply, independent of the vessel's main electric power plant, must be provided which will enable radio messages to be sent for at least four hours over a distance of at least 100 miles day or night. The emergency power supply and equipment should be located and installed in such manner as to afford maximum protection against accident.

2. The radio transmitting apparatus operated from the emergency power supply, should be capable of functioning within two minutes after unexpected notice to the operator.

3. The complete equipment must be maintained in an efficient condition at sea.

4. The complete emergency equipment should be tested before each sailing and daily at sea by the operator or an inspector and a note of its performance entered in the radio log.

5. Radio inspectors or other duly authorised officers of the Government will occasionally call for test messages to be sent by means of the emergency apparatus, while the vessel is at sea.

6. An "induction coil" connected to "plain aerial" is not recommended as emergency apparatus on account of the high voltages produced which frequently damage the antenna insulation and on account of "vibrator troubles."

7. A motor generator or rotary converter operated by storage battery is probably the most satisfactory means available at present of energising the transmitting apparatus.

8. Any auxiliary engine for wireless purposes must operate on a fuel which will fulfil the requirements of Rule XI, section 5, of the General Rules and Regualtions of the Steam boat Inspection Service, reading as follows:

> None of the inflammable articles specified in section 4472, Revised Statutes, or oil that will not stand a fire test of 300° F. shall be used as stores on any pleasure steamer or steamer carrying passengers except that vessels not carrying passengers for hire may transport gasoline or any of the products of petroleum for use as a source of motive power for motor boats or launches of such vessels (Sec. 4472, R.S.)

9. Every ship station shall carry a reason able number of spares of such parts of both the main and emergency radiotelegraph equipments as are subject to undue wear, deterioration, or liability to accident.

10. One extra pair of head telephones, extra cords, and extra detectors must always be kept on hand.

11. A storage battery voltmeter, hydrometer, a supply of electrolyte, and distilled water should be part of the regular equipment, but are not prescribed in terms by statute. The absence of these and similar inexpensive emergency articles will be brought to the attention of the master and of the company installing the apparatus by the radio inspector, in writing, and if after a reasonable interval they have not been supplied, the inspector will communicate the fact to the Commissioner of Navigation.

12. The vessel's electric power for the operation of the main equipment shall, at all times while the steamer is under way, be available for the radio operator's use. On steamers where the dynamo is not run continuously there should be an efficient means of communication between the radio room and the dynamo room, in order that the radio operator may signal for power, as the law provides that he may not leave his post of duty.

13. Efficient communication between the radio room and the bridge must be maintained. A speaking tube or telephone will comply with this requirement. A bell and messenger service will not be acceptable unless there are special conditions justifying this equipment. The speaking tube or telephone must terminate in the radioroom and on the bridge, or in the chart room if readily accessible from the bridge. If the radio room is adjacent to or accessible from the bridge so that orders may be transferred direct, no means of communication will be required. Any arrangement calling for the services of a third person to transmit the messages will not be satisfactory. The radio inspectors will notify the ship authorities whether the means of communication provided is satisfactory at the time of inspection.

14. On vessels of the United States it is the statutory duty of the master to see that one operator is on duty at all times. The radio service of the ship is under the supreme authority of the master.

15. Masters should require operators on duty to communicate with the officer on the bridge every half-hour.

16. Operators must make entries on the radio log *every fifteen* minutes, as evidence that a continuous watch is being maintained. The entries must, if possible, consist of the call letters of other stations communicating and a few words of the intercepted messages.

17. When vessels are in port the key to the radio room must at all times be on board in charge of the proper officer and the radio equipment shall be in such condition as to facilitate Government inspection.

CLASSIFICATION OF SHIP STATIONS AND GRADES OF OPERATORS REQUIRED.

18. First Class: Vessels having a continuous service. There shall be placed in the first-class vessels which are intended to carry twenty-five or more passengers:

(1) If they have an average speed in service of fifteen knots or more.

(2) If they have average speed in service of more than thirteen knots, but only subject to the two-fold condition that they have on board 200 persons or more (passengers and crew), and that, in the course of their voyage, they go a distance of more than 500 sea miles between any two consecutive ports.

19. Second Class: Vessels having a continuous *watch* but a *service* of limited duration. Other vessels placed in the second-class *must*, during navigation, maintain a continuous *watch* for at least seven hours a day, and a *watch* of ten minutes at the beginning of every other hour.

20. Third Class: Vessels which have no fixed periods of service. All vessels which are placed neither in the first nor in the second-class shall be placed in the third-class.

21. *Service* may be defined as preparedness to transmit and receive radio messages or signals at the rate of at least twenty words per minute.

22. *Watch* may be defined as preparedness to receive distress signals and call letters slowly. A "watcher" or cargo-grade operator will summon a first or second-class operator if necessary.

23. All American vessels required by the Act of July 23rd, 1912, to be equipped with radio apparatus, and operators *must* at all hours maintain a continuous *watch*; that is to say, an operator or *watcher* must be "listening-in" continuously. This requirement is outside of and above the requirement based on the classification under which the ship's station is licensed.

24. Vessels voluntarily equipped are not required to maintain this continuous *watch*. Vessels voluntarily equipped are, however, subject to the following requirements as to *watch* according to the class assigned to them in their station licenses.

25. If a licence of the second class be issued to a voluntarily equipped vessel, the station *must* maintain a continuous *watch* for at least seven hours a day and a *watch* of ten minutes at the beginning of every hour.

26. The grade of operators required on vessels of each class are prescribed in the London Convention Service Regulations, Article X. A continuous *watch* may be maintained by one commercial second-grade operator and one cargo-grade operator on cargo steamers.

27. Passenger vessels coming under the Act of July 23rd, 1912, which carry or are licensed to carry twenty-five or more passengers, *must* be placed in the first class:

(*a*) If they have an average speed in service of fifteen knots or more.

(*b*) If they have an average speed in service of more than thirteen knots, but only subject to the twofold condition that they have on board 200 persons or more (passengers and crew), and that in the course of their voyage they go a distance of more than 500 sea miles between any two consecutive ports.

The *service* shall be carried on by at least two commercial first-grade operators.

28. Cargo vessels coming under the Act of July 23rd, 1912, which are required to maintain a continuous *watch*, *must* be placed in the second class if continuous *service* is not maintained. On cargo steamers a continuous *watch* may be maintained by at least one commercial second-grade operator and one cargo-grade operator.

29. Passenger vessels coming under the act of July 23rd, 1912, but which are not *required* to be entered in the first class, *may* be entered in the first or second class, according to whether continuous *service* or continuous *watch* is maintained. The number and grade of operators required is determined by *service* or *watch*. On passenger vessels coming under the Ship Act but entered in the second class at least two second-grade operators are required to maintain continuous watch.

30. Cargo vessels which coming under the Act of July 23rd, 1912, and are required to maintain a continuous *watch*, may be placed in the first class, if continuous *service* is maintained. (For operators, see par. 28.)

31. All vessels voluntarily equipped with radio apparatus and which have no specified hours of *service* or *watch* must be placed in the third class.

32. Any vessel voluntarily equipped may be placed in the first class if continuous *service* is maintained, or in the second class if a continuous *watch*, or a watch of limited duration, such as specified above for vessels of the second class is maintained.

33. In all ship stations transmissions shall be made only by operators holding commercial first or second grade licenses or higher.

34. Commercial *service* shall be maintained by not lower than commercial first-grade operators.

35. Vessels which are voluntarily equipped with radio apparatus for their own convenience and for the correspondence of officers and crew must employ at least one commercial second-grade operator or higher.

36. Radio telephone apparatus on vessels not coming under the Act of July 23rd, 1912, must be operated by a person holding a cargo-grade license or higher.

37. The owners of ship stations desiring to change the classification of a ship must apply for a new license.

LAND-STATIONS.

38. Coast stations are stations which transmit messages to vessels at sea or on the Great Lakes, or whose operations can interfere with the exchange of messages between ship and ship or ship and coast. The principal purpose of the regulation of radio communication, international and national, is to secure the greatest efficiency of maritime communication through this agency, especially as a means of promoting safety to life.

39. Inland stations are stations which cannot transmit messages to vessels at sea or on the Great Lakes and whose operations cannot affect the transmission of messages between ship and ship or ship and coast. This may be due to their geographical location or to their range, dependent on power and aerial, or conditions. In some instances actual inspection may be necessary to determine whether a station should be licensed as a coast station or an inland station. An operator or owner in doubt as to the classification of his station

should communicate the facts to the radio inspector of his district when applying for a licence.

40. Stations are bound to give absolute priority to calls of distress from ships, to similarly answer such calls, and to take such action with regards thereto as may be required.

41. The working of stations shall be organised as far as possible in such manner as not to disturb the service of other stations.

42. All coast stations (par. 38), excepting general and restricted amateur stations, are required to be able to transmit on the wavelengths of 300 and 600 metres for the purpose of transmitting or relaying distress messages or signals and messages relating thereto, it necessary.

43. Coast stations primary intended for long waves and long-distance transmission may instal an auxiliary antenna and auxiliary transmitter to comply with the short wavelength requirements.

44. The international standard wavelength is 600 metres, and the operators of all *coast stations* are required, during the hours the station is in operation, to "listen-in" at intervals of not less than fifteen minutes and for a period of not less than two minutes, with the receiving apparatus tuned to receive this wavelength, for the purpose of determining if any distress signals or messages are being sent and to determine if the transmitting operations of the "listening stations" are causing interference with other radio communication.

45. General public service may be defined as "paid business," conducted on commercial wavelengths between ship and shore or ship and ship.

46. Limited public service may be defined as "paid business" between certain designated land stations, ships or lines of ships, and must be conducted on some authorised wavelength other than 300 or 600 metres.

47. All special service must be conducted on some authorised wavelength other than 300 or 600 metres, not interfering with genral public service.

48. Limited commercial, special amateur, and all stations which have no authorised rates, shall not transmit or accept public correspondence from other stations, except in case of emergency.

49. If a general public-service coast station also maintains a limited commercial service with other stations on land or with vessels at sea, the limited commercial service must be conducted on some authorised wavelength other than 300 or 600 metres, but this service can be authorised on a general public-service coast station license without stating the specific hours, it being understood that the limited commercial service is conducted only when no general public service business is on file.

50. If a general public-service coast station also maintains a public service between fixed points on land, the service between the land stations must be conducted on some authorised wavelength other than 300 or 600 metres, and a separate form, No. 761, should be submitted covering "Limited public service," giving the exact hours of such service.

Classification of Land Stations and Grades of Operators Required.

51. Both coast stations (the word "coast stations," "shore stations," and "coastal stations" are used interchangeably) and inland stations are divided for the purposes of the administration of the Act into the following classes:

(1) Public-service stations—
  (*a*) General.
  (*b*) Limited.
(2) Limited commercial stations.
(3) Experiment stations for the development of radio communication.
(4) Technical and training school station.
(5) Special amateur stations.
(6) General amateur stations.
(7) Restricted amateur stations.

52. Class 1.—(*a*) *Public-Service stations, general*, are those open to general business between coast and ships and include those operated by common carriers under the Act of February 4th, 1887, to regulate commerce, amended June 18th, 1910. They are required to maintain a constant *service* when open. Every coastal station open to public service shall at all times be ready to receive messages of such wavelengths as are required by the International Convention in force. (Sec. 4, Regulation 1, Act of August 13th, 1912.) The station rates are authorised in the licence and published in the Official Berne List. Whenever such stations do not insure a constant service, transmitting and receiving day and night without interruption, the Secretary of the Navy is directed to open naval radio stations within 100 miles thereof to public business. (Sec. 4, Regulation 18, Act of August 13th, 1912.) The Secretary of War is authorised by the Act of May 26th, 1900 (31 Stat., 206), to open Alaskan military stations to public service.

53. General public service shall be conducted only by operators holding commercial first-grade licenses or higher.

54. Class 1.—(*b*) *Public-service stations, limited*, are reserved for a limited public service, determined by the object of the correspondence or other circumstances independent of the system employed. Stations of this class transmit and receive public messages to and from certain stations only, which are designated in the license. The rates are authorised in the licenses, and if not published in the official list they may be obtained from the licensee.

55. The service of limited public service *coast* stations shall be carried on by commercial first-grade operators or higher.

56. The service of limited public service *inland* stations shall be carried on by commercial second-grade operators or higher.

57. Class 2.—*Limited commercial stations* are not open to public service and are licensed for a specific commercial service or services defined in the license. Stations of this class must not transmit to or accept public messages from other stations. No rates are authorised.

58. It a coast station, the operators shall hold a commercial second-grade license or higher. (Par. 57.)

59. Class 3.—*Experiment stations.*—The Secretary of Commerce is authorised by section 4 of the Act to grant special temporary licences "to stations actually engaged in conducting experiments for the development of the science of radio communication, or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours and under such conditions as will insure the least inter-

ference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations." Applicants for such licences should state any technical result they have already produced, their technical attainments, etc. The fact that an applicant desires to experiment with his equipment does not justify or require a license of this class. Most experiments can be made within the limitations of general and restricted amateur station licenses or by use of an artificial antenna to prevent radiation.

60. Experiment stations may be operated by a person holding an experiment and instruction grade license or higher.

61. CLASS 4.—*Technical and training-school stations* will be licensed, according to the degree of technical training attained and imparted and to local conditions.

62. The grade of operators required will be specified when the license is issued.

63. CLASS 5.—*Special amateur stations* may be licensed by the Secretary of Commerce to use a longer wavelength and a higher power on special application. Applications for this class from amateurs with less than two years' experience in actual radio communication will not be approved. The application must state the experience and purpose of the applicant, the local conditions of radio communication, especially of maritime radio communication in the vicinity of the station, and a special license will be granted only if some substantial benefit to the art or to commerce apart from individual amusement seems probable. (Sec. 4, Regulation 15, Act of August 13th, 1912.)

64. Special amateur *coast* stations must be operated by a person holding a commercial second-grade license or higher. Inland stations may be operated by persons holding amateur second-grade licenses or higher.

65. CLASS 6.—*General amateur stations* are restricted to a transmitting wavelength not exceeding 200 metres and a transformer input not exceeding 1 kw. (Sec. 4, Regulation 15, Act of August 13th, 1912.)

66. CLASS 7.—*Restricted amateur stations*, within five nautical miles of a naval or military station, are restricted to a wavelength not exceeding 200 metres and to a transformer input not exceeding ½ kw. (Sec. 4, Regulation 16, Act of August 13th, 1912.)

67. Amateur first or second grade operators or higher are required for general and restricted amateur stations.

68. The license does not specify the number of operators required, but provides that the station shall at all times while in operation be under the care of an operator licensed for that purpose. The grade and number of operators as required by law is determined by the service of the station.

69. *Special stations for exceptional distances* are land stations designed to carry on trans-oceanic radio communication as between the United States and European countries, or between the Pacific coast and Hawaii, or from the United States over similar long distances at sea to another land station, or (inland) to carry on radio communication overland over exceptional distances. These stations will all come under one of the classifications named above and the license will indicate the stations for which communication is authorised and indicate the range.

REGULATIONS COMMON TO LAND AND SHIP STATIONS.

70. Any change in the characteristics of the radio apparatus or service of the station must be authorised by the Secretary of Commerce.

71. Every land and ship station open to general public service shall have, as a part of the station equipment, a copy of the Official Berne List of Radiotelegraph Stations and supplements thereto, as issued to comply with section 2 of the Act of July 24th, 1910. Information concerning the use of this list and method of procuring it is given on page 72, paragraph 196.

72. The service regulations of the London Convention, Article VII, paragraphs 1 and 2*b*, require a reduction of power or range under certain conditions. A proper resistance, impedance coil, or reactance regulator in the primary circuit is recommended. In certain cases the reduction of voltage or decreasing of coupling may be approved upon recommendations of radio inspectors.

73. Persons or corporations holding licenses for radio stations, either land or ship, if practicable, must submit the license to the radio inspector for the district, whenever the station or vessel goes out of commission for a period exceeding three months. The Commissioner of Navigation should be notified promptly of any intention to suspend or discontinue the service of any commercial station.

74. If there is no intention to resume the same service or if the station or vessel will enter a different service from that indicated by the license, the radio inspector will submit the license to the Bureau, together with a statement of the facts. Otherwise the radio inspector may retain the license in his files for safe keeping until the date of its expiration, when it will be forwarded to the Bureau for cancellation.

75. When the station goes into commission the owner may apply to the radio inspector for the return of the license. The radio inspector will satisfy himself that the station corresponds to the schedule of the station as shown in the license, and if so, the license will be returned.

76. Stations desiring to conduct tests should communicate with the radio inspector by letter or telephone, stating the probable length of time that will be required. Stations conducting such tests or temporary experiments should "listen-in," to determine that no interference is being caused, and during the tests should "listen-in" frequently for the interference signal, "QRM." Stations conducting tests should transmit their official call signal frequently. Attention is invited to the Act of August 13th, 1912, section 5:

> That every license granted under the provisions of this Act for the operation or use of apparatus for radio communication shall prescribe that the operator thereof shall not wilfully, or maliciously interfere with any other radio communication. Such interference shall be deemed a misdemeanour, and upon a conviction thereof the owner or operator, or both, shall be punishable by a fine not to exceed five hundred dollars or imprisonment for not to exceed one year, or both.

77. The Department holds that interference caused by tests of the character described above (par. 76) is "wilful" when no "listening-in" precautions are taken and the call signal

of the station sending is not repeated at intervals.

APPLICATIONS FOR SHIP AND LAND STATION LICENSES, RENEWALS, AND DUPLICATES.

78. The Act does not apply either afloat or ashore to—

(*a*) Apparatus for radio communication which merely receives radiograms and is not equipped for sending.

(*b*) Apparatus for the transmission of radiograms exclusively between points in the same State, if the effect of such transmission does not extend beyond the State (so as to interfere with the radio communication of other States), or if the effect of such transmission does not interfere with the reception of radiograms from beyond the State (so as to interfere with the interstate radio communication of that State).

(*c*) Apparatus for radio communication which has been issued to the Organised Militia by the War Department or to the Naval Militia by the Navy Department and is used for official purposes only.

79. The owner or operator of any apparatus who may be in doubt whether his apparatus, under this paragraph, is exempt from license may write the facts to the radio inspector for his district before applying for a license.

80. The apparatus for transmission of radiograms, or signals on any vessel of the United States not permanently moored, requires a license.

81. Apparatus for radio communication on land within the jurisdiction of the United States (excluding the Philippine Islands and excluding apparatus of the Government of the United States) must be licensed if—

(*a*) The apparatus is a means of commercial intercourse among the several States or with foreign nations; or

(*b*) The apparatus transmits radiograms or signals the effect of which at any time extends beyond the State; or

(*c*) The apparatus interferes with the receipt of messages in any State from beyond such State.

82. Station licenses for the use and operation of apparatus for radio communication under the Act may be issued only to citizens of the United States or Porto Rico or to a company incorporated under the laws of some State or Territory or of the United States or Porto Rico.

83. Licenses can be issued to clubs if they are incorporated or if a member will accept the responsibility for the operation of the apparatus, carrying with it the possibility of being penalised for infraction of the laws.

84. Applications for station licenses of all classes should be addressed to the United States Radio Inspector for the district in which the station is located, who will forward the necessary blank forms and information. The limits of the districts and addresses of radio inspectors are given on page 68, paragraph 166.

85. Upon receipt of the forms, properly completed, the radio inspector will make a thorough inspection of the station if practicable.

86. When applications and forms have been properly submitted, ship and amateur stations may be operated in accordance with the laws and regulations governing the class of station for which application for license has been made, until such time as the application can be acted upon unless the applicant is otherwise instructed and provided temporary official call letters are assigned.

87. General and restricted amateur-station licences are issued directly by radio inspectors. Station licences of all other classes are issued from the office of the Commissioner of Navigation, Department of Commerce. Applications and forms are forwarded by radio inspectors with recommendations by them.

88. Stations desiring to operate different portions of the day under different classifications shall submit application for each service, giving exact hours for each. If approved, each classification will be specified in the license.

89. The owner of an amateur station may operate his station in accordance with the laws if his application for a license has been properly filed, but has not been acted upon. An application for an operator's license must also have been filed, and every effort made to obtain the license before the station may be operated.

90. "Provisional" station licenses are issued to amateurs remote from the headquarters of the radio inspector of the district in which the station is located. These licenses are issued as a matter of convenience and record. If, under inspection, the station is found to comply with the law, the inspector will strike out the word "Provisional" and insert the date of inspection and his signature at the bottom of the license.

91. If such a station is found not to comply with the law the provisional license may be cancelled until such time as the apparatus is readjusted to meet the requirements of the law: *Provided, however,* That consideration will be given to any reports of interference filed against such a station.

92. All persons are warned that it is unlawful to operate stations after licenses have expired unless application for renewal has been properly made.

93. Owners desiring to renew licenses must complete new forms as prescribed for original applications. Amateur-station licenses issued on current forms may be renewed by the following endorsement on the back, provided no changes in the equipment or location have been made; otherwise a new license will be issued: "This license renewed for one year. Radio Inspector." The Commissioner of Navigation will be notified of the name and call signal in every case of renewal in this manner.

94. Any person applying for a duplicate licence to replace an original which has been lost, mutilated, or destroyed will be required to submit an affidavit to the Bureau of Navigation through the radio inspector of the district, attesting the facts regarding the manner in which the original was lost. The Commissioner of Navigation will consider the facts in the case and advise the radio inspector in regard to the issue of a duplicate licence or a duplicate will be forwarded through the inspector's office.

95. A duplicate license will be issued under the same serial number as the original and will be marked "Duplicate" in red across the face.

REGULATIONS GOVERNING RADIO OPERATORS.

CLASSES, GRADES AND REQUIREMENTS.

E 96. (1) Commercial extra first grade; (2) commercial first grade; (3) commercial second grade; (4) commercial cargo grade; (5) commercial

temporary permit; (6) experiment and instruction grade; (7) amateur first-grade; (8) amateur second grade.

97. The Service Regulations of the International Convention require that "the service of the station on shipboard shall be carried on by a telegraph operator holding a certificate issued by the Government to which the vessel is subject."

98. Such certificates shall attest the professional efficiency of the operator as regards—

(*a*) Adjustment of the apparatus and knowledge of its functioning;

(*b*) Transmission and acoustic reception at the rate of not less than twenty words a minute (Continental Morse) for commercial first-grade operators and not less than twelve words per minute for second-grade operators;

(*c*) Knowledge of the regulations governing the exchange of wireless telegraph correspondence.

(*d*) The certificate shall furthermore state that the Government has bound the operator to secrecy with regard to the correspondence.

99. The International Convention has been ratified by the principal maritime nations, dominions and provinces. Radio operators holding valid certificates issued by foreign Governments which are parties to the convention will be recognised by this department as persons "skilled in the use of such apparatus" within the meaning of the Act, unless in the case of a specific individual there may be special reason to doubt the operator's skill and reliability. Such certificates should be ready at hand for the inspection of radio inspectors or customs officers before the steamer departs from the United States.

100. In the case of a vessel subject to the Act under the flag of any nation not a party to the International Convention, the radio operator, before the departure of the vessel from the United States, must furnish to the inspector evidence that he is "skilled in the use of the apparatus." This evidence shall consist of an examination on board by the radio inspector.

101. *Commercial extra first class.* — The Department of Commerce will issue a special license, to be known as commercial extra first grade to radio operators whose trustworthiness and efficient service entitle them to confidence and recognition.

102. These licenses will be given consideration by the Civil Service Commission in examinations for positions requiring knowledge of radiotelegraphy, when experience is rated as a part of such examinations.

103. Applicants for the commercial extra first-grade license must pass a special examination. To be eligible for this examination they must hold commercial first-grade licenses, and their certificates of skill in radio communication, issued under the Act of June 24th, 1910, or licenses under the Act of August 13th, 1912, must record eighteen months' satisfactory commercial service at sea or at land stations, either or both, during the two years previous to the filing of the application for examination, as shown by endorsement on the license service records, or other satisfactory evidence, and provided that the applicants have not been penalised for a violation of the radio laws and regulations.

104. A speed of at least thirty words per minute Continental Morse, and twenty-five words per minute, American Morse (five letters to the word), must be attained. The technical questions and the questions on the radio laws and regulations will be considerably wider in scope than those for commercial first grade, and a higher percentage will be required.

105. All examination papers, including the code test sheets, will be marked and forwarded to the Commissioner of Navigation, with a recommendation by the radio inspector or examining officer. Examination papers will be marked upon the basis of 100, and licences will be recommended only if eighty or better is attained.

106. Licenses of this grade will be issued by the Commissioner of Navigation, endorsed by the Secretary of Commerce, and delivered to the successful applicant through the examining officer.

107. *Commercial first class.*—The applicant must pass a satisfactory examination in—

(*a*) The adjustment, operation, and care of the apparatus, including correction of faults and change from one wavelength to another.

(*b*) Transmitting and receiving by ear at a speed of not less than twenty words a minute in Continental Morse (five letters to the word).

(*c*) Use and care of storage battery or other auxiliary power apparatus.

(*d*) Knowledge of the international regulations in force applying to radio communication.

(*e*) Knowledge of the requirements of the Acts of Congress to regulate radio communication (secs. 3, 4, 5, 6, and 7 of the Act of August 13th, 1912).

108. The commercial extra first grade and the commercial first-grade licenses qualify holders for employment at any ship or land station of any class.

109. *Commercial second class.*—The applicant must pass a satisfactory examination in all the subjects prescribed above for the first grade, with the exception that the minimum speed in transmitting and receiving shall not be less than twelve words a minute in Continental Morse, and the examination in the subjects will not be as comprehensive as that given first-grade operators.

110. *Commercial cargo grade.*—Section 2 of the Act of July 23rd, 1912, provides: "On cargo steamers, in lieu of the second operator provided for in this Act, there may be substituted a member of the crew or other person who shall be duly certified and entered in the ship's log as competent to receive and understand distress calls or other usual calls indicating danger, and to aid in maintaining a constant wireless watch so far as required for the safety of life."

111. The examination will be conducted so as to determine the following facts:

(*a*) That the applicant is sufficiently familiar with the Continental Morse Code to recognise the distress signal (SOS), when included in a list of other words or signals sent slowly (approximately five words a minute).

(*b*) That the applicant is sufficiently familiar with the Continental Morse Code to recognise radio call letters of the vessel on which he desires to operate when sent slowly and repeated several times.

(*c*) That the applicant is sufficiently familiar with the type of the receiving

apparatus of the vessel on which he desires to operate to determine by buzzer or similar test that the detector or receiving apparatus is properly adjusted to receive signals.

112. Examining officers and radio inspectors are authorised to issue a certificate, in the form of an amateur first-grade license, after examination, to indicate the facts above enumerated in the case of a member of the crew or other person, and experience under this form will be credited by examining officers if the holder later applies for examination for a commercial licence. These licenses will be marked "Cargo" in the upper right-hand corner under the serial number.

113. *Commercial temporary permit.*—Section 3 of the Act of August 13th, 1912, provides: "In case of emergency the Secretary of Commerce may authorise a collector of customs to issue a temporary permit, in lieu of a license, to the operator on a vessel subject to the Radio Ship Act of June 24th, 1910."

144. The temporary permit, in the form of a letter to the operator, is to be issued only in cases of emergency and will be valid for one voyage from   to
beginning   , unless the proper license or properly licensed operator can be obtained en route.

115. The permits should be issued only to persons who the collector of customs has reason to believe are skilled in the use of the apparatus, but have not had the opportunity to present themselves for examination before Government officers authorised to conduct examinations and furnish licenses.

116. The collector of customs will forward to the Department of Commerce (Bureau of Navigation) a report covering each temporary permit issued and the reasons for its issue.

117. *Experiment and instruction grade.*—Experimenters and instructors of scientific attainments in the art of radio communication whose knowledge of the radio laws satisfies the radio inspector or the examining officer may obtain this grade license, provided they are able to transmit and receive in the Continental Morse Code at a speed sufficient to enable them to recognise distress calls or the "keep-out" signals.

118. The operator's license for this grade is a commercial license, endorsed by the Secretary of Commerce with a statement of the special purpose for which it is valid.

119. If the applicant qualifies, the radio inspector or examining officer will forward the papers to the Commissioner of Navigation, with his recommendation. If approved, the license will be properly endorsed by the Secretary of Commerce and delivered to the licensee through the recommending officer.

120. This license has no reference to the instruction of radio operators as such, but is required by those operating apparatus licensed as experimental stations but who are unable to obtain commercial grade operators' licenses.

121. Amateurs before applying for licenses should read and understand the essential parts of the International Radiotelegraphic Convention in force and sections 3, 4, 5, and 7 of the Act of August 13th, 1912. The Department recognises that radio communication offers a wholesome form of instructive recreation for amateurs. At the same time its use for this purpose must observe strictly the rights of others to the uninterrupted use of apparatus for important public and commercial purposes. The Department will not knowingly issue a license to an amateur who does not recognise and will not obey this principle. To this end the intelligent reading of the International Convention and the Act of Congress is prescribed as the first step to be taken by amateurs. A copy of the radio laws and regulations may be procured for this purpose from the radio inspectors or from the Commissioner of Navigation, Department of Commerce, Washington, D.C., but they are not for public distribution. Additional copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a nominal price.

122. *Amateur first grade.*—The applicant must have a sufficient knowledge of the adjustment and operation of the apparatus which he wishes to operate and of the regulations of the International Convention and Acts of Congress in so far as they relate to interference with other radio communication and impose certain duties on all grades of operators. The applicant must be able to transmit and receive in Continental Morse at a speed sufficient to enable him to recognise distress calls or the official "keep-out" signals. A speed of at least ten words per minute (five letters to the word) must be attained.

123. *Amateur second grade.*—The requirements for the second grade will be the same as for the first grade. The second-grade license will be issued only where an applicant cannot be personally examined or until he can be examined. An examining officer or radio inspector is authorised in his discretion to waive an actual examination of an applicant for an amateur license, if the amateur for adequate reasons cannot present himself for examination but in writing can satisfy the examining officer or radio inspector that he is qualified to hold a license and will conform to its obligations.

Examinations.

124. The following requirements and method of conducting examination for radio operators' licenses will be adopted at all examining offices.

125. The test shall consist of messages with call letters and regular preambles, conventional signals and abbreviations and odd phrases, and shall in no case consist of simple, connected reading matter. The test will be conducted by means of the omnigraph or other automatic instrument wherever possible.

126. The test shall continue for five minutes at a speed of twenty words, twelve words and ten words per minute, respectively, for the commercial first, second, and lower grades, and to qualify the applicant must receive twenty, twelve, or ten words in consecutive order.

127. The code test sheets written by the applicant will be forwarded to the Commissioner of Navigation with other papers and the speed attained noted in the lower left-hand corner of the first sheet.

128. An applicant will be given credit for the maximum speed he can attain.

129. The practical and theoretical examination shall consist of seven comprehensive questions under the following headings and values:

	Points, maximum value.
(*a*) Experience	20
(*b*) Diagram of receiving and transmitting apparatus	10
(*c*) Knowledge of transmitting apparatus	20
(*d*) Knowledge of receiving apparatus	20
(*e*) Knowledge of operation and care of storage batteries	10
(*f*) Knowledge of motors and generators	10
(*g*) Knowledge of international regulations governing radio communication and the United States radio laws and regulations	10
	100

130. Seventy-five constitutes a passing mark for the first-grade commercial. Sixty-five constitutes a passing mark for the second-grade commercial.

131. Applicants who fail to attain twenty words in the code test but who attain a mark of between sixty-five and seventy-five in the written examination may be issued second-class licenses, if they can receive at least twelve words per minute.

132. Question (*a*) shall determine the applicant's practical knowledge and experience in handling radio apparatus. An applicant's experience will be determined largely from the personal question sheet, and from satisfactory letters or references submitted. Experience, operating first-class amateur apparatus, or the apparatus provided in good training schools, will be given a reasonable value, but applicants who have had experience as apprentices at commercial shore stations or on board vessels will receive higher marks.

133. No applicant who fails to qualify will be re-examined at any examining office within three months from date of the previous examination. All examination papers, whether the applicant qualifies or not, will be forwarded to the Bureau of Navigation for filing as "Operator's record." When the records of the Bureau develop the fact that an applicant has failed to qualify and has applied for re-examination or been re-examined at the same or another office within three months, his existing license may be suspended or revoked by the Secretary of Commerce. Applicants to whom are issued second-grade licences will not be examined for first-grade within three months under the same rule.

Places where Examinations are Held.

134. (Excised.)

135. Naval radio stations: San Juan, P.R.; Colon, R.P.; Honolulu, H.T.

136. United States Army stations: Fort St. Michael, Alaska; Fort Valdez, Alaska.

137. Bureau of Navigation, Department of Commerce, Washington, D.C.

138. Radio inspectors, at their offices and elsewhere, by special arrangement.

139. Additional opportunities for taking the examination will be afforded as may be deemed necessary, and these special dates and places may be ascertained by communication with the Commissioner of Navigation, or nearest radio inspector.

140. All licenses, when awarded, will be delivered through the officer who conducted the examination.

141. Examinations for the commercial extra first-grade licenses will be held at the following offices only by appointment.

142. (Excised.)

143. United States radio inspectors, customhouses: New Orleans, La.; San Francisco; Cal.; Seattle, Wash.; Chicago, Ill.; Boston, Mass.; New York, N.Y.; Baltimore, Md.; Detroit, Mich., Norfolk, Va.

144. Commissioner of Navigation, Department of Commerce, Washington, D.C.

145. In special cases, upon application to the Commissioner of Navigation, arrangements may be made for examinations at other points.

Applications for Examinations for Radio Operators' Licenses, Renewals, and Duplicates.

146. An operator's license may be granted to any person without regard to sex, nationality or age if the applicant can fulfil the requirements for the class of license desired.

147. Applicants for licenses should communicate in writing with the commandants, commanding officers, or officers in charge at navy yards, and army posts, with the Commissioner of Navigation, or radio inspectors, in order to fix the date when they can be examined. (See pars. 134-145.)

148. Commercial licenses can only be obtained by personal examination. Where applicants are at remote points or cannot proceed to examining offices, efforts will be made to examine them through radio inspectors when they are in that vicinity, but special trips cannot be made for that purpose.

149. Amateurs should write to the nearest examining officer in their vicinity (see pars. 134-145) for Form 756 (application for operator's license) and to the radio inspector in their vicinity for Form 762 (application for license for land station). If the application for operator's license is also made to the radio inspector, both applications should be forwarded in the same envelope.

150. Amateur operators at points remote from examining officers and radio inspectors may be issued second-grade amateur licenses without personal examination. Examinations for first-grade licenses will be given by the radio inspector when he is in that vicinity, but special trips cannot be made for this purpose (see par. 123).

151. Persons holding radio operator's licenses, amateur second grade, should make every effort to appear at one of the examination points to take the examination for amateur first-grade license or higher.

152. Persons holding radio operator's licenses of any class or grade should, before their licenses expire, apply to the nearest radio inspector or examining officer for renewal and submit Form 756 in duplicate.

153. Radio operators of the commercial class or cargo grade whose licenses show on the service records satisfactory service for three months out of the last six months of the license term may be issued new licenses without re-examination. Other operators who submit satisfactory evidence to the examining officer, showing actual operations of radio apparatus for three months during the last six months of the license term, may be issued new licenses without re-examination. All others will be re-examined in the usual manner.

154. Whether or not a new license is issued, the radio inspector or examining officer will forward one copy of Form 756, properly

completed, to the Commissioner of Navigation, Department of Commerce. If a new license is not issued, the reason therefor will be stated on the back of the form.

155. Any operator applying for a duplicate license to replace an original which has been lost, mutilated, or destroyed will be required to submit an affidavit to the Bureau of Navigation through the radio inspector or examining officer who issued the original, attesting the facts regarding the manner in which the original was lost. The Commissioner of Navigation will consider the facts in the case and advise the radio inspector in regard to the issue of a duplicate license. A duplicate license will be issued under the same serial number as the original and will be marked "Duplicate" in red across the face.

156. Operators' licenses are not valid until the oath for the preservation of the secrecy of messages is properly executed before a notary public or other officer duly authorised to administer oaths. Licenses must indicate on their faces that the oath has been taken and the officer administering the oath on the back of the license should sign also in the blank provided on the face.

157. Operators' licenses should be framed and posted in the radio room, and licenses for stations should be accessible at all times to inspectors.

158. Under the supervision of a licensed operator an apprentice or unlicensed person may learn the art by the actual use of the apparatus, but the licensed operator who fails to enforce obedience to the regulations by the apprentice or unlicensed person serving under his supervision is liable to penalties as if he had himself violated the regulations.

159. An individual record is kept in the Bureau of Navigation, Department of Commerce, at Washington, of each licensed operator. Each operator's examination papers and all reports in regard to interference or violations of the radio laws and regulations are filed for reference.

160. Radio operators holding licenses of any grade or class and applying for examination for any other grade or class must submit to the examining officer Form 756, in duplicate. If a new license is issued the license held by the applicant must be surrendered.

161. Radio operators who pass the examination for a higher class or grade license are required to surrender their existing licenses, which will be forwarded to the Commissioner of Navigation with the other papers.

162. Operators desiring to retain their expired or cancelled licenses may make application therefor to the Commissioner of Navigation.

GENERAL INFORMATION.

Administration and Administrative Districts.

163. The Department has established, for the purpose of enforcing, through radio inspectors and others, the acts relating to radio communication and the International Convention, the following districts, with the principal office for each district at the custom house of the port named.

164. Communications for radio inspectors should be addressed as follows, and not to individuals: Radio Inspector, Customhouse, (city), (State).

165. Communications for the Bureau of Navigation should be addressed as follows, and not to individuals: Commissioner of Navigation, Department of Commerce, Washington, D.C.

166. (1) Boston, Mass.: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut.

(2) New York, N.Y.: New York (county of New York, Staten Island, Long Island, and counties on the Hudson River to and including Schenectady, Albany, and Rensselaer) and New Jersey (Counties of Bergen, Passaic, Essex, Union, Middlesex, Monmouth Hudson, and Ocean).

(3) Baltimore, Md.: New Jersey (all counties not included in second district), Pennsylvania (counties of Philadelphia, Delaware, all counties south of the Blue Mountains, and Franklin County), Delaware, Marlandy, Virginia, District of Columbia.

(4) Savannah, Ga.: North Carolina, South Carolina, Georgia, Florida, Porto Rico.

(5) New Orleans, La.: Alabama Missis sippi, Louisiana, Texas, Tennessee, Arkansas, Oklahoma, New Mexico.

(6) San Francisco, Cal.: California, Hawaii, Nevada, Utah, Arizona.

(7) Seattle, Wash.: Oregon, Washington, Alaska, Idaho, Montana, Wyoming.

(8) Detroit, Mich.: New York (all counties not included in second district), Pennsylvania (all counties not included in third district), West Virginia, Ohio, Michigan (Lower Peninsula).

(9) Chicago, Ill.: Indiana, Illinois, Wisconsin, Michigan (Upper Peninsula), Minnesota, Kentucky, Missouri, Kansas, Colorado, Iowa, Nebraska, South Dakota, North Dakota.

Reporting of Violations.

167. The regulations established by law, or by the authority of law, or of the International Convention, will be enforced by the Secretary of Commerce through collectors of customs, radio inspectors, and other officers of the Government.

168. The service regulations of the radiotelegraphic Convention in force provide that "no station on shipboard shall be established or worked by private enterprise without authority from the Government to which the vessel is subject." Such authority shall be in the nature of a license issued by said Government. Stations on foreign ships will be licensed by their Governments respectively. Inspectors will report to the Commissioner of Navigation stations on foreign ships not so licensed.

169. A radio inspector is authorised in exceptional cases to act outside of his district for the convenience of commerce. In such cases he will communicate before or after acting with the inspector in whose district he has acted. Radio inspectors are authorised to communicate directly with collectors of customs and to co-operate with them in the enforcement of the law.

170. Violations of the laws and regulations will be reported to the chief customs officer of the district in which the offence occurs, who will report the case to the Secretary of Commerce (Bureau of Navigation), according to the procedure followed in violations of the navigation laws. Misdemeanours will be reported to the United States district attorney in the usual manner.

171. Collectors of customs and radio inspectors are enjoined that the reports required by paragraph 170 must be precise statements of the facts as the basis for possible proceedings by the United States attorney.

172. Violations by the master of a vessel of the United States of the provisions of the second paragraph of section 1 of the ship act will be reported to the collector of customs directly, and the usual procedure in cases of fines and penalties will be followed.

Inspection of Ship Stations.

173. The radio inspectors and customs officers, as far as practicable shall visit steamers subject to the act before they leave port and ascertain if they are equipped with the apparatus in charge of the operators prescribed by law and regulation.

174. When the radio apparatus is certified as complying with the requirements of law by the competent authorities of a foreign Government, such certificate will be recognised by this Department, but the radio inspector or customs officer may, if he deem it necessary or desirable, satisfy himself that the apparatus is in good working order.

175. Whenever practicable the radio inspector shall satisfy himself on his visit before the departure of a steamer subject to the act of July 23rd, 1912, that the apparatus is efficient and in good working order within the meaning of the Act, and if satisfied he shall issue a certificate in the form of Appendix A (form 752). The duplicate of these certificates will be filed with the collector of customs as a record of the radio equipment on vessels sailing from his port.

176. These certificates will be issued only if the inspection is made within two hours of sailing time.

177. For each clearance the master of a steamer coming under the Act of July 23rd, 1912, is required to furnish to the customs officer a certificate in the form in Appendix B (Form 753). Such certificate shall be retained in the files of the collector of customs. Whenever the radio inspector is absent from his home port he will notify the collector of customs, who will arrange for the collection of certificates and survey of equipment.

178. Where a steamer subject to the radio law is without the apparatus and the operators prescribed, or either of them, and is about to attempt to leave port, the radio inspector or customs officer visiting the vessel shall:

(*a*) Furnish the master with a memorandum (stub of Form 771) of the particulars in respect of which the law has not been complied with and the penalty;

(*b*) if convenient, notify the vessel's agents or the proper person in charge of the apparatus so that the necessary corrections may be made before sailing.

179. If a steamer clears in violation of the law the radio inspector or customs officer shall submit to the collector of customs of the port a written report, stating the exact nature of the violation, the section of the law violated, and the penalties involved and all of the circumstances in connection therewith which will be of service to the collector and to the Secretary of Commerce in determining what action shall be taken. A copy of the report will be forwarded to the Commissioner of Navigation.

180. Statements should be obtained from operators, ships officers, or other witnesses at the time the violation is discovered and should accompany the report to the collector of customs.

181. The collector of customs will report the case to the Secretary of Commerce in the usual manner as a navigation fine case.

182. Merchant vessels chartered by the United States Government are subject to the Act of August 13th, 1912, in every case, if the radio apparatus is owned and operated by a commercial company.

183. Merchant vessels chartered by the United States Government for the transportation of persons or supplies are subject to the requirements of the ship act (Act of July 23rd, 1912), if the vessel is controlled and operated by the owners. Vessels commanded wholly or in part by Government officers are not subject to the ship act.

184. Government vessels or vessels charted by the Government are subject to the act of August 13th, 1912, if the radio equipment is owned and operated by private interests.

185. The ship act does not authorise the refusal of clearance in case of violation of its provisions, but specifically provides for the imposition of a fine in a sum not more than $5,000.

186. The act does not apply to a vessel at the time of entering a port of the United States. Radio inspectors and customs officers may, however, accept as evidence of the efficiency of the operators and the skill of an operator messages shown to have been transmitted and received by him over a distance of at least 100 miles, by day, during the voyage to the United States.

Operators on Foreign Vessels.

187. In so far as licensed operators are concerned a sharp distinction should be drawn between the Act of July 23rd, 1912, which requires apparatus and operators for radio communication on steamers and the Act of August 13th, 1912, to regulate radio communication.

188. The Act of July 23rd, 1912, amending the Act of June 24th 1910, is designed to promote safety at sea through the employment of apparatus and operators to transmit and receive distress calls and other calls relating to perils and aids to navigation. It provides that in the case of American and foreign vessels subject to its provisions "the radio equipment must be in charge of two or more persons skilled in the use of such apparatus." This Act does not require that the operators shall be licensed, and the penalty prescribed in section 3 of the Act is not incurred by the master of a vessel whose operators are "skilled in the use of such apparatus," even though they may not be licensed.

189. The Act of August 13th, 1912, is designed to execute in behalf of the United States the International Radiotelegraphic Convention and thus to promote orderly exchanges by radio communication. For this purpose the International Radiotelegraphic Convention (Service Regulations) provides that the service of the station on shipboard shall be carried on by a telegraph operator holding a certificate issued by the Government to which the vessel is subject.

190. Section 3 of the Act of August 13th, 1912, carries out this provision of the International Convention by providing licenses for operators on American vessels. If an unlicensed person serves in charge or in supervision of the use and operation of the apparatus both he and his employer are liable to a fine of not more than $100 or imprisonment for not more than two months or both. This section and penalty do not apply to operators on foreign ships. But operators on the ships of foreign nations signatory to the International Radiotelegraphic Convention, as shown above,

are required to have certificates or licenses from their own governments, and if not so certificated, the obligations of the convention have not been observed. The convention in the Service Regulations provides for this situation.

191. The Act of July 23rd, 1912, as stated, requires that on American and foreign ships the operators must be "skilled in the use of such apparatus," but does not require that they must be licensed. To facilitate commerce and simplify administration, operators presenting American licenses or foreign certificates are accepted as "skilled in the use of such apparatus," except where there may be special reasons to doubt the operator's skill or reliability. Where operators on American or foreign ships do not have such licences or foreign certificates, radio inspectors or customs officers under the Act of July 23rd, 1912, may accept other competent evidence of skill or may examine such operators.

Official International List or Coast and Ship Radio Stations of the World and Station Rates.

192. The list of land and ship stations of the United States including amateurs, giving call letters, wavelengths, nature of service, etc., can be procured from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a nominal price.

193. Supplements to this list are issued monthly and the list is revised annually, as of July 1st. Information concerning amateur stations will not be included in the supplements, but in the annual edition only.

194. The introduction to the list of "Radio Stations of the United States" contains information concerning the assignment of international and amateur call letters.

195. A copy of the Official Berne List, and supplements as issued, are required as a part of the equipment of every station open to general public service.

196. The International List of Radio Stations of the World (edition in English) can be procured from the International Bureau of the Telegraphic Union (Radiotelegraphic Service), Berne, Switzerland.

197. In addition to the information contained in the pamphlet of the United States stations, published by the Bureau of Navigation, the international list shows geographical locations, normal ranges in nautical miles, radio systems and rates.

198. The international list includes the Government and commercial land and ship stations of the United States. The list is divided into three parts. The first part contains a list of ship stations, grouped by countries and arranged alphabetically; the second part contains a list of land stations arranged in the same manner; and the third part contains tables of land line and cable charges from coast radio stations to inland and various other points. In computing the total word rate applicable to a radiogram from a ship station to an inland point or *vice versa*, the three rates must be added. The rates in the international list are stated in francs. For approximate purposes 1 franc equals 20 cents and 5 centimes equals 1 cent. Supplements to the international list will be issued monthly, and will contain new stations and tables of alterations.

199. The International Alphabetical List of Call Letters (stations of the world) is also issued by the international bureau at Berne, and supplements will be issued monthly.

200. Neither the international list proper nor the supplements will contain a list of amateur stations.

201. Inquiries as to the subscription price of these lists should be made direct to the Berne bureau, at the address given above. (See par. 196.) Remittances to Berne should be made by international postal money order.

Miscellaneous Information.

202. Stations equipped to receive only do not require licenses.

203. Operators of receiving stations do not require licenses, but *all persons* are required to maintain secrecy in regard to messages, as provided in the Act of August 13th, 1912, nineteenth regulation of section 4.

204. Distances under the radio laws are computed in nautical miles.

205. No fees are charged for any operator or station license.

206. Licensed stations must be operated by or under the direct supervision of properly licensed operators.

207. Amateur stations within five miles of naval or military stations need not have been in actual operation on or before August 13th, 1912, to obtain a license for a restricted amateur station.

208. The master of a vessel shall have the right to censor all messages addressed to or transmitted by a radio telegraph station on board his vessel, but such master shall not divulge to any person (other than the properly authorised officials of the Government, or a competent legal tribunal) or make any use whatever of any message coming to his knowledge through the exercise of such censorship, nor shall the master or any operator divulge to any person (other than the properly authorised officials of the Government, or a competent legal tribunal) or make any use whatever of any message (other than a message of distress) coming to his knowledge and not intended for the said station.

209. The transmission of superfluous signals by any ship or coast station is absolutely prohibited; trials and practices are forbidden except under such circumstances as to preclude the possibility of interference with other stations.

210. No person shall transmit or make a signal containing profane or obscene words or language.

211. Additional or amendatory regulations will be issued from time to time as they may appear necessary.

Radio Service Form 752.

CERTIFICATE OF RADIO INSPECTION.

Port of

19

GThis is to certify that I have to-day examined the apparatus for radio communication on the s.s. of which is master, about to leave this port for , and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed)

Radio Inspector.

(Or)

Customs Inspector.

Radio Service Form 753.

MASTER'S CERTIFICATE OF RADIO APPARATUS.

NOTICE.

H The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars. (Act of July 23rd, 1912.)

PORT OF

19

This is to certify that I have to-day examined the apparatus for radio communication on the S.S. , of which I am master, about to leave this port for , and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed) , *Master.*

No.

RADIO SERVICE FORM 753A.

RADIO DECLARATION.

(To be submitted in duplicate.)

I NOTICE.—"The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of the r watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars." —*Act of July 23rd*, 1912.

Port of ....

Date......................., 19..

This is to certify that the (nationality) ...... s.s. .... of the (name of company or line) .... of which I am master, entered this port on .... 19.. having in crew (number) .... persons and licensed or certificated to carry (number) .... passengers; that the said vessel (is/is not) * equipped with radio apparatus as required by the Act of June 24th, 1910, as amended July 23rd, 1912; that the radio station is in charge of (number) ...... properly licensed radio operators and the apparatus is

....

Master or Agent.

in efficient/inefficient † condition.

This form should be filed in duplicate with the Collector of Customs at time of entry, who will furnish one copy to the radio inspector of the district on the date of entry in order that proper inspection may be made of the radio apparatus prior to the clearance of the vessel.

* Strike out *is* or *is not* as the case may be.

† Strike out *efficient* or *inefficient* as the case may be.

RADIO FORM 753B.

MASTER'S CERTIFICATE OF RADIO APPARATUS.

J NOTICE.—"The radio equipment must be in charge of two or more persons skilled in the use of such apparatus, one or the other of whom shall be on duty at all times while the vessel is being navigated. Such equipment, operators, the regulation of their watches, and the transmission and receipt of messages, except as may be regulated by law or international agreement, shall be under the control of the master, in the case of a vessel of the United States; and every wilful failure on the part of the master to enforce at sea the provisions of this paragraph as to equipment, operators, and watches shall subject him to a penalty of one hundred dollars." —*Act of July 23rd*, 1912.

CLEARANCE.

Port of ....

.... 19..

This is to certify that I have to-day examined the apparatus for radio communication on the (nationality) .... s.s. ....

....

of which I am master, about to leave this port for .... and I have found the same efficient and in good working order, as prescribed by the Act of June 24th, 1910, as amended by the Act of July 23rd, 1912.

(Signed) ....

Master.

LICENSE FOR GENERAL PUBLIC SERVICE COAST RADIO STATION.

DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION.

RADIO SERVICE.

K Pursuant to the Act to regulate radio communication, approved August 13th, 1912, , a citizen of the State of

....

a company incorporated under the laws of the State of having applied therefor, is hereby granted by the Secretary of Commerce for a period of on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this license to use or operate the apparatus for radio communication (identified in the schedule hereinafter) located in the State of city or town of , for the purpose of transmitting to and receiving from ship stations and other land stations general public correspondence, Government and service correspondence, and distress signals and messages, at rates of compensation not in excess of those fixed by the international agreement to which the Government of the United States has adhered, which have been submitted to and approved by the Secretary of Commerce, as included in the schedule hereinafter.

2. The use or operation of apparatus for radio communication pursuant to this license shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President "to the end that the same and every article and clause thereof may be observed and fulfilled with good faith by the United States and the citizens thereof, and shall be subject also to such regulations

as may be established from time to time by authority of subsequent acts and treaties of the United States.

3. The authority conferred by this license is subject to the provisions of the Act of February 4th, 1887, entitled "An Act to regulate commerce," as amended by the Act of June 18th, 1910, so far as the licensee may be within the operation of said Act, and except as provided in the Act of August 13th, 1912, or in the International Radiotelegraphic Convention and regulations made part thereof, the station shall transmit all messages offered by those who tender lawful rates on equal terms without discrimination, whether as regards rates, order of transmission, or otherwise.

4. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

5. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

6. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, shall refrain from sending until all signals and radiograms relating thereto are completed.

7. The station during the hours of operation shall listen-in at intervals of not less than 15 minutes and for a period of not less than two minutes with the receiver tuned to receive messages of 300 metres wavelength.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall exchange radiograms with any other commercial station and with any ship station without distinction of the radio systems adopted by such stations.

10. The station shall not use a transmitter during the first 15 minutes of each hour, local standard time, except for distress signals, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of time, pursuant to the Twelfth Regulation by the Act of August 13th, 1912.

11. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

12. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

13. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Location: State, ..., County; ....; City or Town,........ Street,..............; No............
....
....

Geographical location: Latitude, N..°..′..″ Longitude, W..°..′..″

Specific hours authorised during which the station must be open to service (local standard time):
....

Power: Transformer input, ...kw.

Normal day range in nautical miles with ships at sea....................

Time and method, if any, of sending time signals and hydrographic and meteorological radiograms:
....
....

Call letters............
............; Coast charges: per word........ minimum per radiogram........
............; Coast charges: per word........ minimum per radiogram........
............; Coast charges: per word........ minimum per radiogram........

Radiotelegraphic system employed:........
....

Characteristics of transmitting system:
Type of spark gap, ...
Approximate spark frequency, ...
....

Characteristics of receiving system:
Type of receiver, ...
Wavelength of receiving system: From ....meters to........meters.

Antenna: Number of masts, ...; Height, ..., ..., ..., ...
....

Type of aerial, ...
Wires: Number, ...; Size and kind, ...
Essential dimensions, ...
....
....

Sending wave length.*	Antenna current (amperes).	Logarithmetic decrement.
600 metres		
300 metres		
metres		
metres		
metres		
metres		

* Underscore normal.

The station insures rapid exchange with land wire stations of the

....
(Company.)
....
(Location telegraph office.)
....
(Company.)
....
(Location telegraph office.)

in the following manner: ....
....

Satisfactory proof has been furnished that the station was actually operating August 13th, 1912.

This license will expire on the............. day of............, 19..

....
Secretary of Commerce.

....
Commissioner of Navigation.

Washington, D.C...............19....

INSPECTIONS.

Date.	Inspector.	Remarks.

WAVELENGTHS.

The normal sending and receiving wavelength shall be metres, and no other wavelength shall be used for general public correspondence with any foreign ship or foreign coast station, except for long-range public service or purposes other than general public correspondence.

The station shall at all times, except as provided in the seventh paragraph of this licence, be ready to receive messages of such wavelengths as are required by the International Radiotelegraphic Convention; shall be prepared to use two sending wavelengths, one of 300 metres and one of 600 metres, as required by the International Radiotelegraphic Convention in force; and tuning positions on the receiver shall be plainly marked: Provided, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservations to accord with any international agreement to which the United States is a party.

No.

LICENSE FOR SHIP RADIO STATION.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.
RADIO SERVICE.

L Pursuant to the Act to regulate radio communication, approved August 13th, 1912

a citizen of the State of

For long-range public service and for any service other than general public correspondence the station is authorised to use the following additional wavelengths under 600 or over 1,600 metres:

Metres, ; Metres, ; Metres,
Metres, ; Metres,

The energy, if radiated by the transmitter in two or more wavelengths as indicated by a sensitive wavemeter, shall not in any one of the lesser waves exceed 10 per cent. of that in the greatest; and the logarithmic decrement per complete oscillation in the wave trains shall not exceed two-tenths, except when sending signals or messages relating to vessels in distress.

....

a company incorporated under the laws of the State of , having applied therefor, is hereby granted by the Secretary of Commerce for a period of

on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this license to use or operate the apparatus for radio communication (identified in the schedule hereinafter) on the .... called
(Type of vessel.)

......................, a vessel of the
(Name of vessel.)

United States, official number , for the purpose of transmitting to and receiving from other ship stations and land stations general public correspondence, Government and service correspondence, and distress signals and messages, at rates of compensation not in excess of those fixed by the International Agreement to which the Government of the United States has adhered, which have been submitted to and approved by the Secretary of Commerce, as included in the schedule hereinafter.

2. The use or operation of apparatus for radio communication pursuant to this license shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President "to the end that the same and every article and clause thereof may be observed and fulfilled with good faith by the United States and citizens thereof," and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States.

3. The authority conferred by this license is subject to the provisions of the act of February 4th, 1887, entitled "An Act to Regulate Commerce," as amended by the Act of June 18th, 1910, so far as the licensee may be within the operation of said Act, and except as provided in the Act of August 13th, 1912, or in the International Radiotelegraphic Convention and regulations made part thereof, the station shall transmit all messages offered by those who tender lawful rates on equal terms without discrimination, whether as regards rates, order of transmission, or otherwise.

4. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations, and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

5. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, except when in case of emergency the Collector of Customs by authority of the Secretary of Commerce shall issue a temporary permit, in lieu of a license, to the operator. The operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

6. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress shall refrain from sending until all signals and radiograms relating thereto are completed.

7. The station shall be prepared to send the international signal of distress and distress signals on the normal wavelength designated by the International Radiotelegraphic Convention in force with sufficient power to

enable them to be received by day over sea a distance of 100 nautical miles by a ship station equipped with apparatus for sending and receiving equal in all essential particulars to the apparatus of the station herein licensed.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall exchange radiograms with any other ship station without distinction of the radio systems adopted by such stations.

10. The station shall not use, except for sending signals of distress or signals and radiograms relating thereto, or when, owing to unusual circumstances, communication can be established only by means of an increase of power, a transformer input exceeding 1 kw., or exceeding ½ kw. when within five nautical miles of a naval or military station.

11. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus, or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

12. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting, and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

13. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Ship: Name, ...; Owner, ...; Home port, ...; International code letters, ...
Radio call letters: ....
Nature of service: ....
Hours of operation: ....
Power: Transformer input, ... kw.
Primary source of power, ...
Normal day range in nautical miles with other ships at sea, ...
Ship charge: Per word, ...; Minimum per radiogram ....
Per word ....; Minimum per radiogram ....
Radiotelegraphic system employed: ....
Characteristics of transmitting system:
Type of spark gap, ...
Approximate spark frequency, ...
....
Characteristics of receiving system:
Type of receiver, ...
Wavelength range of receiving system:
From ...... metres to ...... metres
....
Antenna: Number of masts, ...;
Height, ..., ..., ..., ...
Type of aerial ....
Wires: Number, ...; Size and kind, ...
Essential dimensions, ...
....

Auxiliary apparatus: Type, ...
Power: Source, ...; Normal day range with ships, ...

Sending wave-length.*	Antenna current (amperes).	Logarithmic decrement.
600 metres		
300 metres		
metres		
metres		
metres		
metres		

* Under score normal.

WAVELENGTHS.

The normal sending and receiving wavelength shall be 600 metres, and the station shall be prepared to use two sending wavelengths, one of 600 metres and one of 300 metres, as required by the International Radiotelegraphic Convention in force; and tuning positions shall be plainly marked: Provided, That the Secretary of Commerce may, in his discretion, change the limit of wavelength reservations to accord with any international agreement to which the United States is a party.

A wavelength of metres and the following additional wavelengths not exceeding 600 metres may be employed as authorised by law and treaty:
Metres, ; Metres, ; Metres
Metres, ; Metres, ; Metres,
Metres, ; Metres,

The energy, if radiated by the transmitter in two or more wavelengths as indicated by a sensitive wavemeter, shall not in any one of the lesser waves exceed 10 per cent. of that in the greatest; and the logarithmic decrement per complete oscillation in the wave trains shall not exceed two-tenths, except when sending signals or messages relating to vessels in distress and in sending distress signals when the transmitter may be tuned to create a maximum of interference with a maximum of radiation.

The station in general shall transmit its radiograms to the nearest coast station. The sender shall have the right, however, to designate the coast station through which he desires to have his radiograms transmitted, and his wishes shall be complied with only if the transmission can be effected without interfering with the service of other stations, or the shipboard station shall wait until such coast station shall be the nearest as provided by the International Convention in force.

Satisfactory proof has been furnished that the station was actually operating August 13th, 1912.

This license will expire on the day of 19

[SEAL.] *Secretary of Commerce.*

Commissioner of Navigation.
Washington, D.C., 19

INSPECTIONS.

Date.	Inspector.	Remarks.

No.

LICENSE FOR LAND RADIO STATION.

Class

DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.
RADIO SERVICE.

M Pursuant to the Act to regulate radio communication, approved August 13th, 1912,

a citizen of the State of a company incorporated under the laws of the State of , having applied therefor, is hereby granted by the Secretary of Commerce for a period of on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this license to use or operate the apparatus for radio communication (identified in the schedule hereinafter) for the purpose of transmitting to and receiving from ship stations and other land stations public correspondence, Government and service correspondence, and distress signals and messages at rates of compensation not in excess of those fixed by the international agreement to which the Government of the United States has adhered, which have been submitted to and approved by the Secretary of Commerce, as included in the schedule hereinafter, or for the purpose of conducting experiments for the development of the science of radio communication or the apparatus pertaining thereto, to carry on special tests, using any amount of power or any wavelengths, at such hours and under such conditions as will insure the least interference with the sending or receipt of commercial or Government radiograms, of distress signals and radiograms, or with the work of other stations, the purpose of the station being designated by the classification at the head of this license.

2. Public correspondence or limited commercial correspondence authorised by this license shall be limited to certain stations, ships or lines of ships named hereinafter, which designation is authorised in view of the nature of the service and is independent of the radio system employed.

3. The use or operation of apparatus for radio communication pursuant to this license shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President, and shall be subject also to such regulations as may be established from time to time by authority of subsequent Acts and treaties of the United States, in so far as they apply to the class of station indicated by this license.

4. The authority conferred by this license is subject to the provisions of the Act of February 4th, 1887, entitled "An Act to Regulate Commerce," as amended by the Act of June 18th, 1910, so far as the licensee may be within the operation of said Act, and except as provided in the Act of August 13th, 1912, or in the International Radiotelegraphic Convention and regulations made part thereof, the station shall transmit all messages offered by those who tender lawful rates on equal terms without discrimination, whether as regards rates, order of transmission, or otherwise.

5. The licensee shall render to the Secretary of Commerce such accounts as the Secretary of Commerce shall direct in respect of all charges due or payable under the International Radiotelegraphic Convention in respect of messages exchanged between the station hereby licensed and other stations, and shall pay to the Secretary of Commerce, at such times and in such manner as the Secretary of Commerce shall direct, all sums which shall be due from the licensee under such accounts.

6. The apparatus shall at all times while in use and operation be in charge or under the supervision of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

7. The station shall give absolute priority to signals and radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and, except when engaged in answering or aiding the ship in distress, shall refrain from sending until all signals and radiograms relating thereto are completed.

8. The station shall use the minimum amount of energy necessary to carry out any communication desired, except in case of signals or radiograms relating to vessels in distress.

9. The station shall not use a transmitter during the first fifteen minutes of each hour, local standard time, except for distress signals, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of time, pursuant to the Regulation 12 of the Act of August 13th, 1912.

10. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus, or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

11. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

12. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following schedule, except with the approval of the Secretary of Commerce.

SCHEDULE OF STATION AND APPARATUS.

Name of owner ....
Location: State, ...; County, ...; City or town, ...; Street, ...; No. ....
....
....

Geographical location: Latitude, N. . .° . .′ . .″; Longitude, W. . .° . .′ . .″

This station is licensed for communication only with the following land stations, ships, or lines of ships:

....
....
....
....

Specific hours during which the station must/may be open to service (local standard time): ....
....

Power: Transformer input, ... kw.
Normal day range in nautical miles, ...
Time and method, if any, of sending time signals and hydrographic and meteorological radiograms:
....
....
Call letters, ...
............; Coast charges: per word ....; minimum per radiogram ....
............; Coast charges: per word ....; minimum per radiogram ....
............; Coast charges: per word ....; minimum per radiogram ....
Radiotelegraphic system employed, ...
Characteristics of transmitting system:
Type of spark gap, ...
Approximate spark frequency, ...
....
Wavelength range of receiving system: From .... metres to .... metres.
Antenna: Number of masts, ...
Height, ..., ..., ..., ...
Type of aerial, ...
Wires: Number, ...; Size and kind, ...
Essential dimensions, ...
....
....

Wavelengths.

The normal sending and receiving wavelength shall be metres.

If the station be classified as a coast station, it shall be prepared to transmit or relay distress calls or messages using the distress wavelength as provided by the International Radiotelegraphic Convention in force.

In view of special conditions the station is authorised to use for communication exclusively with stations licensed by the United States the following additional wavelengths under 600 or over 1,600 metres:
Metres, ; Metres, ; Metres, ; Metres,

The energy, if radiated by the transmitter in two or more wavelengths as indicated by a sensitive wavemetre, shall not in any one of the lesser waves exceed 10 per cent. of that in the greatest; and the logarithmic decrement per complete oscillation in the wave trains shall not exceed two-tenths, except when sending signals or messages relating to vessels in distress.

The station insures rapid exchange with land wire stations at

....
(Company.)
....
(Location telegraph office.)

Sending wavelength.	Antenna current (amperes).	Logarithmic decrement.
300 metres		
600 metres		
metres		
metres		
metres		
metres		

....
(Company.)
....
(Location telegraph office.)

in the following manner: ....
....

This license will expire on the............. day of................, 19..
[SEAL OF DEPARTMENT OF COMMERCE.]

....
Secretary of Commerce.
Commissioner of Navigation.
Washington, D.C., ...19..

Inspections.

Date.	Inspector.	Remarks.

LICENSE FOR (General or restricted) AMATEUR RADIO STATION.

DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.
RADIO SERVICE.

N Pursuant to the act to regulate radio communication, approved August 13th, 1912, , a citizen of the State of , having applied therefor, is hereby granted by the Secretary of Commerce, for a period of year , on and subject to the restrictions and conditions hereinafter stated and revocable for cause by him, this license to use or operate the apparatus for radio communication (identified in the Schedule hereinafter) for the purpose of transmitting private radiograms or signals, notwithstanding the effect thereof extends beyond the jurisdiction of the State or Territory in which the said station is located: *Provided,* That no interference other than may result under the restrictions contained in this licence shall be caused with the radio communication of stations of the Government of the United States or licensed stations.

2. The use or operation of apparatus for radio communication pursuant to this license shall be subject also to the articles and regulations established by the International Radiotelegraphic Convention, ratified by the Senate of the United States and caused to be made public by the President, and shall be subject also to such regulations as may be established from time to time by authority of subsequent acts and treaties of the United States.

3. The apparatus shall at all times while in use and operation be in charge of a person or persons licensed for that purpose by the Secretary of Commerce, and the operator of the apparatus shall not wilfully or maliciously interfere with any other radio communication.

4. The station shall give absolute priority to signals or radiograms relating to ships in distress; shall cease all sending on hearing a distress signal; and shall refrain from sending until all the signals and radiograms relating thereto are completed.

5. The station shall use the minimum amount of energy necessary to carry out any communication desired, and the transformer input shall not exceed $\frac{\text{one}}{\text{one-half}}$ kilowatt.*

6. The station shall not use a transmitting wavelength exceeding 200 metres.

* Strike out "one" if the station be within five nautical miles of a naval or military station; otherwise strike out "one-half."

7. The station shall not use a transmitter during the first 15 minutes of each hour, local standard time, whenever the Secretary of Commerce by notice in writing shall require it to observe a division of the time, pursuant to the Twelfth Regulation of the Act of August 13th, 1912.

8. The President of the United States in time of war or public peril or disaster is authorised by law to close the station and cause the removal therefrom of all radio apparatus, or may authorise the use or control of the station or apparatus by any department of the Government upon just compensation to the owners.

9. The Secretary of Commerce and Collectors of Customs or other officers of the Government authorised by him may at all reasonable times enter upon the station for the purpose of inspecting and may inspect any apparatus for radio communication of such station and the operation and operators of such apparatus.

10. The apparatus shall not be altered or modified in respect of any of the particulars mentioned in the following Schedule except with the approval of a radio inspector or other duly authorised officer of the Government.

SCHEDULE OF STATIONS AND APPARATUS.

Name of owner, ... Age, ...
Location: State, ...
...................; County, ...
City or town,.............; Street, ...
No. .... Official call,............
Name of naval or military station, if within five nautical miles, ...
....
Power: Transformer input,............W.*
Antenna: Type (T, ⅂, fan, umbrella, etc.),
....
Height, ...;
Horizontal length, ...
(Above ground.)
Wires: Number in vertical part, ...
In horizontal part, ...

The normal sending and receiving wavelength shall be...............metres and the
(Not exceeding 200.)
station is authorised to use the following additional wavelengths, not exceeding 200 metres: .... metres, ... metres.

Satisfactory proof has been furnished that the station was actually operating August 13th, 1912.

This license expires on............. 19..

C. H. HUSTON,
Assistant Secretary of Commerce.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Delivered by ....
(Radio inspector.)
Place, ...
Date, ... 19.... No....

* Not to exceed 1,000; or if the station be within five nautical miles of a naval or military station, not to exceed 500.

THE UNITED STATES OF AMERICA.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.

LICENSE TO RADIO OPERATOR, COMMERCIAL EXTRA FIRST CLASS.

O This is to certify that has been examined and passed, pursuant to the Radiotelegraphic Convention, in

(*a*) adjustment, operation and care of apparatus;

(*b*) transmitting and sound reading at a speed of words a minute, Continental Morse, and words a minute, American Morse;

(*c*) use and care of storage battery or other auxiliary;

(*d*) knowledge of international regulations and Acts of Congress to regulate radio communication;

(*e*) knowledge of United States Naval Radio Regulations;

and is hereby licensed, as required by law, Radio Operator, Commercial Extra First Grade, for two years.

In testimony of trustworthiness and efficient service as Radio Operator for months, of which months were service at sea, and of superior knowledge and skill, ascertained by special examination this extra grade license is granted.

.... Oath of Secrecy executed.
(Examining Officer.)

....
Secretary of Commerce.

....
(Title) *Notary Public.*

....
Commissioner of Navigation.

Place............ Date............ 19...

This license is not valid until the following oath has been executed:—

I,..........................do solemnly swear that I will faithfully preserve the secrecy of all messages coming to my knowledge through my employment under this license; that this obligation is taken freely without mental reservation or purpose of evasion, and that I will well and faithfully discharge the duties of the office: So help me God.

....
(Signature of holder.)

Date of birth, ...
Place of birth, ...
Sworn to and subscribed before me this........
day of.................. A.D. 19....

....
Notary Public

SEAL.

SERVICE RECORD.

This is to certify that the holder of this license has served satisfactorily as radio operator under my orders during the period named.

Name of Ship or Land Station.	Period	Master, Manager, or Superintendent.
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....

Operators must have the service record on the backs of their license properly completed and signed by the master of their ship or their employer.

No.

THE UNITED STATES OF AMERICA.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.

LICENSE TO RADIO OPERATOR,
COMMERCIAL* CLASS.

GRADE.

P This is to certify that
has been examined and passed pursuant to the Radiotelegraphic Convention, in

(*a*) adjustment, operation and care of apparatus;

(*b*) transmitting and sound reading at a speed of not less than† words a minute, Continental Morse;

(*c*) use and care of storage battery or other auxiliary;

(*d*) knowledge of international regulations and Acts of Congress to regulate radio communication;

and is hereby licensed as required by law a Radio Operator, Commercial * grade for two years. The candidate's practical knowledge of adjustment was tested on a set of apparatus. His knowledge of other systems is shown below.

....

....

....

HERBERT HOOVER,
Secretary of Commerce.

..................Oath of Secrecy executed.
(Examining Officer.)

E. T. CHAMBERLAIN,
Commissioner of Navigation.

....
(Title.) *Notary Public.*
Place .... Date........... 19...

This license is not valid until the following oath has been executed :—

I,..........................do solemnly swear that I will faithfully preserve the secrecy of all messages coming to my knowledge through my employment under this license; that this obligation is taken freely without mental reservation or purpose of evasion, and that I will well and faithfully discharge the duties of the office: So help me God.

....
(Signature of holder.)

Date of birth, ...
Place of birth, ...
Sworn to and subscribed before me this........
day of.................. A.D. 19....

....
Notary Public.

SEAL.

SERVICE RECORD.

This is to certify that the holder of this license has served as radio operator under my orders during the period named.

Name of Ship or Land Station.	Period.	Master, Manager or Superintendent.
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....

Operators must have the service record on the backs of their license properly completed and signed by the master of their ship or their employer.

No.

THE UNITED STATES OF AMERICA.
DEPARTMENT OF COMMERCE.
BUREAU OF NAVIGATION.

LICENSE TO RADIO OPERATOR,
AMATEUR FIRST GRADE.

Q This is to certify that
has been examined and shown to have a knowledge of the adjustment and operation and of the regulations of the Radio telegraphic Convention and the Acts of Congress in so far as they relate to interference with radio communication and impose certain duties on all grades of operators sufficient to entitle him to a license, and he is hereby licensed as required by law Radio Operator, Amateur First Grade for two years.

The candidate was examined and shown to have knowledge (excellent or good) in the following additional subjects:

(*a*) general adjustment, operation and care of apparatus ‡....................;

(*b*) transmitting and sound reading Continental Morse at a speed of § words a minute;

(*c*) general knowledge of international regulations and Acts of Congress to regulate radio communication ‡.................

.... Oath of Secrecy executed.
(Examining Officer.)

....
(Title.) *Notary Public.*
Place.............., Date.......... 19....

HERBERT HOOVER,
Secretary of Commerce.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

This license is not valid until the following oath has been executed :—

I,..........................do solemnly swear that I will faithfully preserve the secrecy of all messages coming to my knowledge through my employment under this license; that this obligation is taken freely without mental reservation or purpose of evasion, and that I will well and faithfully discharge the duties of the office: So help me God.

....
(Signature of holder.)

Date of birth, ...
Place of birth, ...

* First or Second. † Twenty or Twelve.
‡ Excellent or good. § Insert speed.

Sworn to and subscribed before me this........ day of.................. A.D. 19....

....

SEAL. *Notary Public.*

SERVICE RECORD.

This is to certify that the holder of this license has served as radio operator under my orders during the period named.

Name of Ship or Land Station.	Period.	Master, Manager or Superintendent.
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....
....	From ...., 19.., to ...., 19..	....

Operators must have the service record on the back of their license properly completed and signed by the master of their ship or their employer.

No.

THE UNITED STATES OF AMERICA.

DEPARTMENT OF COMMERCE.

BUREAU OF NAVIGATION.

RADIO SERVICE.

LICENSE TO RADIO OPERATOR, AMATEUR SECOND GRADE.

This is to certify that has presented satisfactory evidence that he has a knowledge of the adjustment and operation of apparatus and of the regulations of the Radiotelegraphic Convention and the Acts of Congress, in so far as they relate to interference with radio communication and impose certain duties on all grades of operators, sufficient to entitle him to a license, and he is hereby temporarily licensed as RADIO OPERATOR, AMATEUR SECOND GRADE, for the period of eight months or until he has been duly examined.

He has shown that he has knowledge (excellent or good) of the following additional subjects:

(a) General adjustment, operation, and care of apparatus........................

(Excellent or good.)

(b) Transmitting and sound reading Continental Morse at a speed of words a minute.

(c) General knowledge of international regulations and Acts of Congress to regulate radio communication......................

(Excellent or good.)

.... Oath of Secrecy executed:

(Certifying Officer.)

....

(Title.) *Notary Public.*

Place,................ Date, ..., 19....

HERBERT HOOVER,
Secretary of Commerce.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

I, ... do solemnly swear that I will faithfully preserve the secrecy of all messages coming to my knowledge through my operations under this license; that this obligation is taken freely, without mental reservation or purpose of evasion; and that I will well and faithfully observe the obligation of a licensed radio operator: So help me God.

....

(Signature of holder.)

Date of birth, ...

Place of birth, ...

Sworn to and subscribed before me this........ day of .... A.D. 19..

....

Notary Public.

SEAL.

NOTICE TO BERNE BUREAU.

The Minister of Marine of the United States of America has notified to the Berne Bureau that the following information is to be published:—

1. The Departments of the United States Government which are concerned with wireless telegraphy regret that they have not yet been able to make arrangements with the land telegraph of the United States owing to the fact that these are in the hands of commercial companies, and have nothing to do with the Government. The idea was to arrange for the free transmission over the land telegraph, in accordance with Article 14, paragraph 2, of the Rules of Service of the London Convention The information to be transmitted free of charge was all such as related to the date and the hour of the handing in of radiotelegrams on board ship. But the transmission of such information over land lines being subject to a tax, the Government of the United States cannot, at present, conform strictly to this rule of the Convention. The declaration of the American delegation contained in Article 2 of the Final Protocol made provision for such a possible outcome, although its exact nature was not actually set forth.

2. Multiple radiotelegrams, such as are mentioned in article 38, paragraph 5, of the Rules of Service, will be accepted as multiple messages in all wireless transmission between ship and shore stations, but all the companies operating land telegraph lines in the United States will consider, and will charge for, a multiple wireless message as consisting of so many individual telegrams as the addresses it bears may indicate.

3. The United States is not a member of the International Telegraphic Union and consequently is not bound to execute the rules laid down in Article 38, paragraph 8, of the London Convention Rules of Service concerning urgent radiotelegrams. The laws of the United States regulating all reciprocal arrangements between the States forbid the use of the privilege, and consequently all telegraph companies will not allow any priority in favour of telegrams for which any additional tax may have been paid.

An Act to authorise the President of the United States to arrange and participate in an international conference to consider questions relating to international communication.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be, and he is hereby, requested and authorised in the name of the Government of the United States to call, in his discretion, an international conference to assemble in Washington, and to appoint, by and with the advice and consent of the Senate, representatives to participate therein, to consider all international aspects of communication by telegraph, telephone, cable, wireless telephone, and wireless telegraphy, and to make recommendations with a view to providing the entire world with adequate facilities for international communication on a fair and equitable basis.

SEC. 2.—That the sum of $75,000, or so much thereof as may be necessary, is hereby appropriated out of any money in the Treasury not otherwise appropriated, the same to be disbursed under the direction and in the discretion of the Secretary of State for expenses incidental to the conference, including personal services in the District of Columbia notwithstanding the provisions of any other Act: Provided, That no part of said sum shall be used in entertainment or for the purchase of medals and badges.

Approved, December 17th, 1919.

U.S. RADIO COMPASS STATIONS.

Masters of vessels are invited to make use of the U.S. naval radio compass (direction finding) stations to fix positions. They will be found especially useful during thick weather.

The following U.S. naval shore radio compass stations are now in operation for the purpose of furnishing bearings in the Western Atlantic and the Gulf of Mexico. For the present there will be no charge for bearings furnished.

RADIO COMPASS STATIONS ON ATLANTIC AND PACIFIC COASTS ALPHABETICALLY BY NAMES OF STATIONS.

ATLANTIC COAST.

Name of Stations.	Call Signal.	Name of Stations.	Call Signal.
Amagansett, N.Y.	NBM	Gloucester, Mass.	NAD
Bar Harbour, Me. (Otter Cliffs, Me.)	NBD	Grand Island, La.	NLI
Bethany Beach, Del.	NSD	Hog Island, Va.	NCZ
Burrwood, La.	NBX	Jupiter, Fla.	NAQ
Cape Elizabeth, Me. (Portland)	NAB	Key West, Fla.	NAR
Cape Hatteras, N.C.	NDW	Mantoloking, N.J.	NAH
Cape Henlopen, Del.	NSD	North Island, S.C.	NZW
Cape Lookout, N.C.	NAN	Pass A Loutre, La.	NBX
Cape May, N J.	NSD	Poyner's Hill, N.C.	NCZ
Chatham, Mass.	NXA	Price's Neck, R.I.	NAF
Deer Island, Mass.	NAD	Rockaway Beach, N.Y.	NBT
Fire Island, N.Y.	NAH	Sandy Hook, N.J.	NAH
Folly Island, S.C.	NZV	Surfside, Mass. (Nantucket)	NBS
Fourth Cliff, Mass.	NAD	Virginia Beach, Va.	NCZ

U.S. PACIFIC COAST.

The following stations on the Pacific Coast are completed and in commission to give continuous service to shipping :—

PACIFIC COAST.

Name of Stations.	Call Signal.	Name of Stations.	Call Signal.
Bird Island, Calif.	NLD	Point Arguello, Calif.	NPK
Cattle Point, Wash.	NFN	Point Fermin, Calif.	NPX
Empire Oreg.	NPF	Point Hueneme, Calif.	NMD
Eureka, Calif.	NPW	Point Loma, Calif.	NPL
Farallons Island, Calif.	NPI	Point Montara, Calif.	NLH
Fort Stevens, Oreg.	NPE	Point Reyes, Calif.	NLG
Imperial Beach, Calif.	NPL	Port Angeles, Calif.	NFT
New Dungeness, Wash.	NFT	Smith Island, Wash.	NFH
Ocean Park, Wash.	NPE	Tatoosh, Wash.	NPD

Masters of ships are informed that in making use of the San Francisco Harbour entrance group they are requested to call the Farallon Island Station, who will obtain bearings from the remaining stations in the group and furnish them to the ship, after corrections have been applied.

When a request for bearings is made the central control station invariably answers with a bearing from each of the compass stations under its control.

The following signals have been authorised and will be used until further notice :—

SIGNAL.	MEANING.
QTE ?	What is my true bearing ?
QTE	Your true bearing is....degrees from...........Radio Compass Station.
QTF ?	What is my position ?
QTF	Your position is latitude........ longitude........

To obtain bearings the compass station should be called in the usual manner, using the 800-meter wavelength, the call to be followed by the signal "QTE ?," meaning "What is my true bearing ?" When told by the compass station to "K" (go ahead) the ship's radio operator should follow the procedure outlined below :—

(*a*) Transmit the ship's radio call for 30 seconds.

(*b*) Make dashes, each dash five seconds long, for one minute, with the ship's radio call after each dash.

(*c*) Terminate with the signal "K" (go ahead).

If satisfactory bearings are obtained the operator at the compass station will call the vessel in the usual manner and reply "QTE," followed by the true bearing in degrees (0 to 359) spelled out in words, and the name of the radio compass station from which the bearing was obtained; otherwise a repetition of the test will be requested.

The ship's operator should acknowledge receipt of the bearings by answering the compass station in the usual manner and repeat, in numerals, the bearings received. This procedure enables all stations concerned to check the bearings.

All U.S. naval shore radio compass stations keep watch and transmit on 800 metres for merchant vessels, and this wavelength must be used for calling and answering and carrying on all communications with these stations.

Attention is invited to the fact that when a single bearing is furnished there is a possibility of an error of 180 degrees, as the operator at the compass station cannot always determine on which side of his station the vessel lies; in such cases the decision is left to the commander of the vessel.

Subject to the foregoing, bearings should be accurate within 2 degrees of an arc. When bearings from three or more compass stations are not over 2 degrees of arc in error, but do not meet at a fixed point, the geometrical centre of the triangle formed by the bearings can generally be taken as the approximate position of the vessel.

The primary object of these stations is to assist in the navigation of vessels during atmosphere of low visibility.

In order that the operation of shore radio compass stations may be checked up, it is requested that a brief report be forwarded to the Director, Naval Communications, Navy Department, Washington, D.C., containing the following particulars :—

1. Name of ship;
2. Name of radio compass station;
3. Date of G.M.T. at which radio bearing was taken;
4. Bearing given by radio compass station;
5. Estimated position of ship at above time and dates by methods other than radio;
6. The probable degree of accuracy of the estimated position;
7. Weather conditions at above time;
8. Remarks, if any;
9. Signature of master or responsible navigating officer.

ACCURACY OF RADIO BEARINGS.

The following information was furnished by the Director of the U.S. Naval Communication Service under date of October 10th, 1919 :—

"The reliance that can be placed in bearings furnished by shore radio compass stations will be governed by the following conditions :—

"(*a*) When two sets of bearings are received which do not agree, a third set should immediately be requested.

"(*b*) In thick weather, bearings should be requested at least every half-hour.

"(*c*) Bearings that pass over intervening land or that are tangent to the shore line are not as reliable as those that have a clear sweep over the sea.

"(*d*) Navigators receiving a set of bearings should immediately investigate the approximate fix indicated and determine whether or not they are being furnished with bearings from the stations that should be most reliable.

"(*e*) When the position of the ship as indicated by the radio bearing differs materially from the position of dead reckoning, a second set of radio bearings should be requested in order to check the first radio position."

NOTE.—While the Navy Department states that at the present time radio compass bearings have reached a high degree of accuracy, it must be understood that the Government incurs no liability for any consequences resulting from any inaccuracy in the taking or transmission of radio compass bearings. These bearings are provided free of charge, as aids to navigation, to be used at the discretion of the master of the vessel.

PUBLIC RESOLUTION :

No. 48—66TH CONGRESS.

V Joint Resolution to authorise the operation of Government-owned Radio Stations for the use of the general public, and for other purposes.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled : That all land, ship and airship radio stations, and all apparatus therein owned by the United States may be used by it for receiving and transmitting messages relating to Government business, compass reports and the safety of ships.

SEC. 2. That the Secretary of the Navy is hereby authorised, under terms and conditions and at rates prescribed by him, which rates shall be just and reasonable, and which, upon complaint, shall be subject to review and revision by the interstate Commerce Commission, to use all radio stations and apparatus, wherever located, owned by the United States and under the control of the Navy Department—(*a*) for the reception and transmission of press messages offered by any newspaper published in the United States, its territories or possessions, or published by citizens of the United States in foreign countries, or by any press association of the United States, and (*b*) for the reception and transmission of private commercial messages. Provided : That the rates fixed for the reception and transmission of commercial messages, other than press messages, shall not be less than the rates charged by privately-owned and operated stations for like messages and service : Provided further, That the right to use such stations for any of the purposes named in this section shall terminate and cease as between any countries or localities or between any locality and privately operated ships, whenever privately owned and operated stations are capable of meeting the normal communication requirements between such countries or localities or between any locality and privately operated ships, and the

Secretary of Commerce shall have notified the Secretary of the Navy thereof, and all rights conferred by this section shall terminate and cease in any event two years from the date this resolution takes effect.

SEC. 3. That all stations owned and operated by the Government, except as herein otherwise provided, shall be used and operated in accordance with the provisions of the Act of Congress entitled "An Act to regulate radio communication," approved August 13th, 1912.

Approved, June 5th, 1920.

URUGUAY

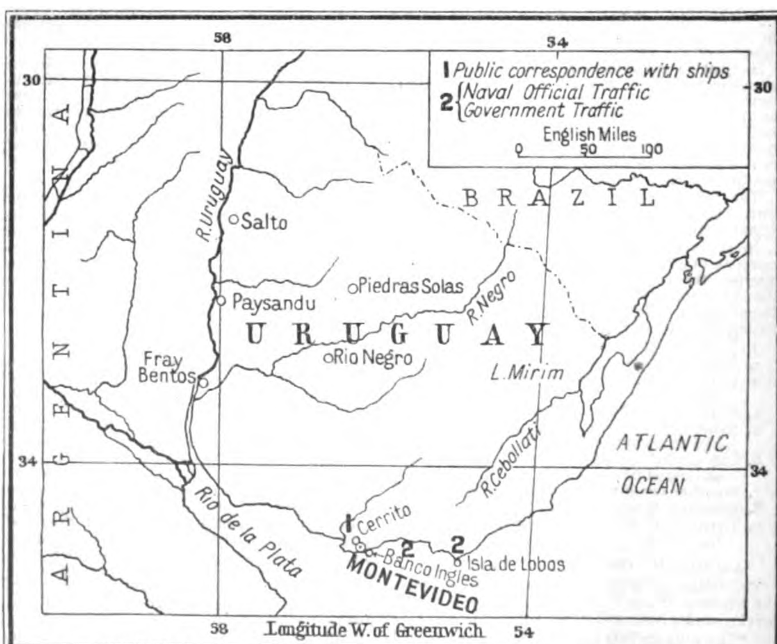
THE independence of the Republic of Uruguay, originally part of the Spanish Viceroyalty of Rio de la Plata, and later on a Province of Brazil, was declared on August 25th, 1825, and recognised by Treaty on August 27th, 1828. The constitution was sworn on July 18th, 1830, and reformed in January, 1918. Legislation is administered by a Parliament of two Houses, the Executive being in the hands of a President elected every four years, and a National Adminstrative Council composed of nine members. The total area of the nineteen departments into which the country is divided is estimated at 72,153 square miles. The capital city is Montevideo, situated on the northern bank of the River Plate Estuary.

CONTROL.

Wireless telegraphy in Uruguay is controlled by the Government, the department in charge being the Ministry of War and Marine. The Government ship stations are also under the control of the Minister of War and Marine. There are no privately owned stations. There are no radiotelegraphic clubs or societies, in fact wireless telegraphy is entirely a Government monopoly.

ORGANISATION.

The installation of wireless telegraphy in Uruguay was authorised by a Government Decree dated June 22nd, 1910. This Decree provided for one



long-distance station at Montevideo, minimum range 500 miles; two situated respectively at Paso de los Toros and Rivera (Northern Frontier), with minimum range of 372 miles; two respectively situated at Lobos Island and the English Bank, each with minimum range of five miles; besides installations on the various Government vessels. By the end of the year 1911 the service (supplemented by two Military Field Stations) was in working order.

The Montevideo station, opened to the public in December, 1911, and standing on a hill three miles from the river, is the only installation doing international work. Its location is called Cerrito de la Victoria, and the wireless station generally goes by the name of "Cerrito." The installations situated at Rivera and Paso de los Toros are employed solely for military purposes, and only in times of crisis, should a breakdown of the ordinary wired service eventuate, are they used for public messages.

Officials Controlling Wireless Telegraphy.

Official.	*Title.*	*Address.*
Dr. Arturo Gaye ..	Acting *pro tem.* as Minister for War	Montevideo
Sr. Bernardo Kay..	Engineer Inspector-General.. ..	Calle Pereira 74, Montevideo
Sr. Juan P. Camera	Secretary	Calle Ituzaingo 1278, Montevideo
Lieut.-Col. Carlos Du Pre	Chief of Montevideo Station (Cerrito)	Montevideo
Sr. Cesar y Vidal Pineiro	Chief of Paso de los Toros Station	Paso de los Toros
Sr. Gualberto Oriel	Chief of Rivera Station	Rivera

ADMINISTRATION.

The first Decree regulating the subject was issued by the Ministry of War and Marine on September 5th, 1911, and was followed by a decree dated January, 1912. Under its provisions *all ships calling at the ports of the Republic and destined for passenger service are obliged to be fitted with wireless apparatus.*

We print here the text of both the Decrees above referred to:—

A—Decree of September 5th, 1911.
B—Decree of January, 1912.

Decree of September 5th, 1911.

A 1. The National Wireless Telegraphy Office is under the direct control of the Ministry of War and Marine, with the Engineer Inspector-General as its head.

2. The National Wireless Telegraph Office is in charge of and controls all the radio-telegraphic stations, whether fixed or military movable ones, on vessels or on lighthouses, together with their staff, apparatus and installations.

3. The Inspector-General will at such times and under such circumstances as he thinks proper make visits of inspection of the stations in order to take personal cognisance of their requirements, and he exercises in regard to the staff, whether military or civil, the character of a staff commander.

4. On the occasions of manœuvres the Inspector-General will designate the country stations which are to take part in accordance with the instructions he receives as to the requirements of the occasion.

5. It is one of the duties of the National Wireless Telegraph Office to propose to the superior department the construction of fresh stations and to report regarding the means for acquiring the same.

6. The Inspector-General controls the sums received for transmission of telegrams, which sums shall be deposited in the Bank of the Republic to the order of the Minister of War and Marine.

7. The National Wireless Telegraph Office will make contracts with the General Post and Telegraph Office and with the shipping companies to be submitted for approval to the Minister of War and Marine; similarly the office is empowered to draw up with the administrations of the neighbouring States radiotelegraphic agreements with the object of improving and amplifying the international wireless telepraph service, all of which shall be submitted for approval by the higher department.

8. The Minister of War and Marine will notify the International Office in Berne of the creation of the National Wireless Telegraph Office in Uruguay, so that in future all questions concerning wireless telegraphy in Uruguay may be referred direct to it.

9. The Inspector-General will report quarterly to the Minister of War and Marine regarding the general conditions and working of the service under his charge, and will compile an annual memorandum upon the general work of his department.

DECREE OF JANUARY, 1912.

B

1. Commencing from May 1st of the present year (1912) all the ships carrying passengers between the harbours of the Republic and those of foreign countries shall be fitted with radiotelegraph installations.

2. The said installations shall be designed to receive and transmit telegrams up to a distance of not less than one hundred kilometres on the ships of river navigation, and four hundred kilometres on those of the oceanic navigation.

3. The installations shall be permanently kept in good conditions of working, and capable of intercommunicating with the stations of the Republic.

4. The stations shall be in charge of persons well acquainted with the use of radiotelegraph apparatus.

5. The service of the stations shall be entirely in accordance with the provisions of the International Radiotelegraph Convention.

6. The agents of the companies will inform, before expiration of the time fixed, the General Inspector of the National Service of Wireless Telegraphy of the characteristics, system, power, etc., of the radiotelegraph apparatus to be fitted on the ships of their companies.

7. The ships which after expiration of the time fixed by Article 1 have not complied with the provisions of this Decree shall not be authorised to carry passengers in the harbours of the Republic.

8. Those ships which do not keep their wireless apparatus in proper working conditions shall be liable to have applied to them the penalty specified in the previous article (7).

9. The General Inspector of the National Service of Wireless Telegraphy is hereby entrusted with seeing that the provisions of this Decree are duly complied with.

VENEZUELA

THE Republic of Venezuela was formed in 1830 by secession from the other members of the Republic of Colombia. The Constitution in force is that of June 13th, 1914. Legislative authority is vested in a Congress of two Chambers, whilst the Executive Power is exercised by a President in conjunction with Cabinet Ministers. The twenty states, two territories and one Federal district of which it is composed cover an area of 398,594 square miles.

The territory included under the Administration of Venezuela is the same as that which was known, at the time South America was a Spanish colony, as "Capitania General de Venezuela," and extends from British Guiana on the east to the Republic of Colombia on the west. Its northern boundary is the Caribbean Sea, and its southern boundary the Republic of Brazil. There are included in the Venezuelan territory many islands in the Caribbean Sea, the principal being Margarita, Cubagua, Los Roques, Coche, Tortuga.

The superficial area of the country is 1,432,000 square kilometres.

The form of government is Federal Republican, democratic and representative. The Legislative power is exercised by two Chambers, the Senate and the Deputies, the former being representative of the different states, and the latter being representative of the people. The Federal States have administrative and financial autonomy. The Central Government devotes itself to the general interests of the country.

CONTROL AND ORGANISATION.

Wireless telegraphy has not yet been established as a public service. Trials have been made by individuals, but no permanent installation for public use exists. A small installation for students has been established at Puerto Cabello for the use of a Government School of Wireless Telegraphy, established in June, 1917.

Dr. Luis Soriano, former Director of the Physical Laboratory at the Central University, was the first to make experiments with wireless telegraphy in Venezuela.

Wireless telegraphy is under jurisdiction of the Central Government.

Private concerns are not allowed to erect or work wireless. The Government could at any time grant licenses for the establishment of a wireless service by private companies or individuals.

As regards communication within the country, the right to establish public wireless communication is comprised in the State monopoly for any kind of telegraph communication, as indicated in the extract from the Laws relating to Telegraphs and Telephones printed here.



OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Dr. Gumersindo Torres	Minister of Fomento	Caracas
Dr. C. Gimenez Rebolledo	Minister of War	Caracas
General Tobias Uribe	Director-General of Telegraphs and Telephones	Caracas
Dr. S. Key Ayala	Director of Posts and Telegraphs at the Ministry of Fomento	Caracas

There are no companies manufacturing wireless apparatus or engaged in wireless business of any kind in Venezuela.

There are no wireless societies, clubs, or publications in the country.

The National Government is considering the establishment of radiotelegraphy from two points of view, namely, as regards the working of a high-power station which will guarantee direct communication with Europe and the United States, and also as regards the interior service of the country.

Allied with the second point of view is the establishment of a small training station which shall serve for the training of operators. This station is of two kilowatts, Marconi system, situated at the high part of Caracas in front of the Bay of Catia which gives easy access to the waves transmitted towards the sea and has been able to maintain communication with Curaçao and Trinidad. Three stations are desired, two of five and one of three and a half kilowatts, two of which stations will be established at the towns of Maracay and San Cristobal respectively. A portable military station has also been asked for for the use and instruction of officers of the Army.

By decree dated July 23rd of the present year was created the National School of Radiotelegraphy, an institution destined to provide the country with native operators for the service. The school is directed by Mr. H. R. von Eichwald, a Venezuelan by naturalisation.

For this same purpose three young Venezuelans were sent to the United States to study radiotelegraphy. These young men were granted an allowance by the Government, and have undertaken to return and lend their services to the country.

ADMINISTRATION.

The laws and regulations relating to wireless telegraphy and telephony are contained under the following :—

A—Radiotelegraphic Regulations.

B—Instructions for Radio Telegraphic Stations.

DOCTOR V. MARQUEZ BUSTILLOS,

Provisional President of the Republic,

in virtue of Clause 10 of Article 79 of the National Constitution

DECREES THE FOLLOWING

A RADIOTELEGRAPHIC REGULATION. HEADING No. I.—PRELIMINARY CONDITIONS.

ART. 1.—Wireless telegraphy or radiotelegraphy in Venezuela will be governed by the Law of Telegraphs and Telephones, by the International Radiotelegraphic Convention, by the other special conventions made in respect thereto, by the conditions of the present Decree, and by others that may be prescribed.

ART. 2.—Pre-eminent control and administration of radiotelegraph installations will be in the hands of the Ministry of Public Works; but if the Federal Executive should desire it, they can in war time be placed under the direction of the War Office and Admiralty.

ART. 3.—The National territory is divided into two zones, subject to regulation and jurisdiction. The maritime zone comprises the territorial waters of the Republic, including the navigable rivers. The terrestrial zone embraces all the other installations erected within the Venezuelan territory, including islands, shores and banks.

ART. 4.—With the exception of National or foreign warships, no ship which is anchored may use its radiotelegraph installations, while it is not sailing, unless justified by reason of urgency.

ART. 5.—According to their purpose, radiotelegraph stations are divided as follows:—1st, central station; 2nd, local stations; 3rd, training stations; 4th, portable stations.

ART. 6.—Only the National Government may possess radiotelegraph stations in the terrestrial zone of Venezuela. Private people may be able to use them, subject to the ruling conditions and tariffs.

ART. 7.—All National or foreign merchant vessels carrying more than fifty passengers on an ordinary voyage, whether they put in or anchor at Venezuelan ports, must be in possession of a wireless telegraph installation in perfect condition, and another emergency installation besides, which can work for at least six hours, and be set quickly to work in case of the former apparatus getting out of order in times of danger.

ART. 8.—Boats excepted by the International Conventions and those exclusively devoted to coast navigation through National territorial waters are exempted from carrying wireless installations.

Boats which are exempted from the said obligation may not possess radio installations without previous permission from the Federal Executive.

GENERAL CONDITIONS.

FIRST SECTION.

Signals and Radiotelegraphic Waves.

ART. 9.—The exchange of signals, superfluous words, experimenting or practising that may in any way interrupt radiotelegraphic correspondence is forbidden at ordinary stations.

ART. 10.—The normal length of a wave will be 600 metres. Training and portable stations shall use a smaller one, to be fixed for them, so as not to interfere with ordinary communications.

ART. 11.—Permission is given in exceptional circumstances for other wavelengths to be used in accordance with the limits of the International Regulations.

ART. 12.—The signs used for radiotelegraphic communications will be those of the International Morse alphabet.

ART. 13.—Ships in distress will use the sign adopted by the International Conventions.

ART. 14.—As soon as a station hears danger calls, it shall suspend all correspondence and not resume it until after having made certain that the communication of danger has been concluded; it shall attend to the calls wherever there origin may be, and answer them; it shall in conformity with the notifications from the ship communicate with the authorities of the respective littoral.

ART. 15.—In radio communications between coast and ship stations the call, pauses and inquiries noted in the Regulation annexed to Radiotelegraphic Convention, signed in London on the 5th July, 1912, shall be observed; this will not prevent the use of others for interior service, but in this case the use of those universally adopted signals that might cause confusion is strictly forbidden.

SECOND SECTION.

(1) *Personnel of the Radiotelegraph Service.*

ART. 16.—The Director-General of Telegraphs and Federal Telephones will be the head of the radiotelegraph stations in everything concerning the service. Anything relating to the inspection and working of the installations, complaints, fulfilment of regulations and application of penalties is included in his duties which he shall exercise direct, giving an account of each case to the Ministry of Public Works.

ART. 17.—For the supervision of installations, the Ministry of Public Works may appoint inspectors of radiotelegraphy, with jurisdiction over a particular littoral.

ART. 18.—The radiotelegraphic service of each installation shall be performed by an operator who holds a first-class efficiency certificate. The latter includes:—

(*a*) A knowledge of the apparatii and of their arrangement and working;

(*b*) A capacity for transmitting and receiving audibly at a minimum speed of twenty words a minute;

(*c*) A knowledge of the International Regulations, local laws and regulations compulsorily applicable to the service and exchange of radiotelegraph communications.

ART. 19.—In exceptional cases, when the service has to be entrusted to an operator who has only a second-class certificate, the latter must guarantee the same efficiency as a first class, except in regard to speed transmission and reception capacity, which must never be less than twelve words a minute.

ART. 20.—The duties of bookkeeping and filing at radiotelegraph stations are under the charge of the operator and the Exchequer of Federal Telegraphs and Telephones.

ART. 21.—Radiotelegraph stations, according to their importance and local regulations, shall be worked by a requisite subordinate staff in accordance with the dispositions of the Ministry of Public Works, for dealing effectively with the service.

ART. 22.—Radiotelegraph stations shall be connected with the National Telegraph system.

Radiograms may be handed in at ordinary telegraph offices for transmission by wire to the stations. In these cases the receiving clerk must make separate bookkeeping entries.

(*b*) *School of Radiotelegraphy.*

ART. 23.—The School of Radiotelegraphy is an institution for educating the technical staff

of the Republican radiotelegraph and radiotelephone stations.

ART. 24.—The Director-General of Telegraphs and Federal Telephones, the Head Professor and a language Professor will constitute the personnel of the school.

ART. 25.—The Director-General of Federal Telegraphs and Telephones shall exercise control over the school and see that it is well conducted, notifying the Ministry of Public Works every time amendments are necessary or suitable improvements might be adopted.

ART. 26.—The Head Professor, who is immediately subordinate to the Federal Director-General of Telegraphs and Telephones, shall deal with the organisation and working of the institution, and shall besides give instruction on the subjects necessary for the course of training, and in accordance with the programme of studies which he shall elaborate and submit for approval to the Ministry of Public Works.

ART. 27.—The Language Professor shall give pupils the special instruction desired and do his best besides to assist in the good management of the school.

ART. 28.—To be admitted as a pupil in the school the following is necessary :—

(*a*) To be over eighteen and under thirty-five years of age;
(*b*) A holder of a high grade certificate of instruction;
(*c*) To be known to be of good conduct;
(*d*) A holder of a certificate from the National Health Office certifying good health;
(*e*) Written permission from a legal representative in the case of minors.
(*f*) To request registration in a legal form within the prescribed time before the opening of a term. The request shall be addressed to the Minister of Public Works and shall be accompanied by the confirmation that the other requisites herein mentioned are complete.

ART. 29.—The number of pupils that will form a radiotelegraphic course shall in every case be fixed by the Ministry of Public Works.

ART. 30.—Nobody can be appointed to take an operator's position in the Republican Radiotelegraph of Radiotelephone Service who has not obtained a diploma for efficiency.

ART. 31.—In order to obtain the diploma referred to in the previous Article it is necessary to have gone through a course at the School of Radiotelegraphy in the subjects contained in the schedule of studies and to have passed the requisite examination satisfactorily, which shall consist of three divisions :—

(i) A half an hour's oral test on subjects taken by ballot from the programme which shall be done by numbering slips from one upwards to the number of subjects contained in the programme.

(ii) To draw up in fifteen minutes a document of the service proposed by the Examining Board.

(iii) Transmitting and receiving practice for fifteen minutes. In no case will a candidate be approved who has not executed a speed minimum of twelve words a minute.

ART. 32.—The optional examinations for the diploma are always individual ones, and can be arranged at any time on the date fixed by the Ministry of Public Works, in accordance with the request which the candidate must make in legal form, which must bear at the foot thereof the certificate issued by the Director of the School, stating that the candidate has attended the course regularly, been punctual for the classes and done the tasks required in accordance with the schedule of studies.

ART. 33.—If the candidate should be approved, besides the diploma a certificate will be sent him, a first-class one if the transmitting and receiving speed is a minimum of twenty words a minute, and a second-class one if the speed varies between twelve and nineteen words a minute.

ART. 34.—The examining boards for the diploma shall consist of five members: the Director-General of Federal Telegraphs and Telephones, the Head Professor of the School of Radiotelegraphy and three technical specialists, preferably chosen from first-class operators.

THIRD SECTION.

RADIOTELEGRAPHIC SERVICE, OFFICIAL AND PRIVATE.

I.—*Order and Preference.*

ART. 35.—The radiotelegraph service is intended chiefly for commerce and private people. Only when it is a question of messages sent by the President of the Republic or by the Commander-in-Chief of the National Army, in case of interruption of the ordinary lines or on matters of distinct urgency may the wireless telegraph of the terrestrial zone be used for official communications.

ART. 36.—Radiograms shall be despatched in the following order :—

(*a*) Official service, and this will be according to the rank of the sending official.
(*b*) Private radiograms in the order in which they are handed in.

ART. 37.—Radiograms referred to in Article 13 shall have absolute priority.

II.—*Free Traffic.*

ART. 38.—Radiograms will be free that are sent on service matters by officials authorised by the Law on Telegraphs and Telephones of the 20th June, 1918.

ART. 39.—Free traffic is not exempt from the supplementary taxes of ships and other foreign stations that have to handle the communications.

ART. 40.—The right to send a reply free of charge is proved by the presentation of the official radiotelegram or telegram requiring it.

III.—*Tariff.*

ART. 41.—The radiotelegraphic charge will be :—

I.—*For Interior Service.*

(*a*) *Radiotelegraphic charge, properly so-called* at the rate of B. 0.25 a word with a minimum of ten words for every radiogram.
(*b*) *Telegraphic or postal charge*, or both, according to the means of communication to be employed, whenever there is no radiotelegraphic station at the place of origin or destination. and whenever the sender may request these special services.

II.—*For Exterior Service.*

(*a*) *Radiotelegraphic charge properly so-called* at the rate of B. 0.60 per word, with a minimum of ten words for every radiogram.
(*b*) *Coast or ship tax* of the station or ship to which the radiogram is sent according to the special tariff for same.
(*c*) *Telegraphic or postal charge*, or both, according to the means of communication that may have to be employed, whenever there is no radiotelegraphic station at the place of origin or destination, and whenever the sender may request these special services.

Sole paragraph. ***In the radiotelegraphic charge properly so-called*** the address and signature will be collected both for interior and exterior service.

IV.—*Secrecy.*

ART. 42.—All legal dispositions relating to keeping correspondence secret shall be applied to radiotelegrams.

ART. 43.—Only the President of the Republic, the Commander-in-Chief of the National Army, the Ministers of the Interior, the Governor of the Federal District and National Diplomatic Ministers or foreign residential ones may send or receive messages in code without any restriction.

ART. 44.—Subordinate employees will also be allowed to send cypher radiograms when dealing with a reply so required by their superiors mentioned in the foregoing Article.

ART. 45.—In International communications private people may for the purposes of economy use ordinary well-known telegraphic codes; but in every case the translation of the message must be attached so that it can be filed with the original radiogram.

HEADING No. III.
SPECIAL CONDITIONS.

FIRST SECTION.—PENALTIES.

ART. 46.—Breaches of the present Regulations will be punished by fines from 100 to 20,000 bolivares, which will be applied by the Director of Federal Telegraphs and Telephones, or imprisonment in proportion. In the event of their being guaranteed these fines will be subject to appeal before the Ministry of Public Works.

ART. 47.—The possession or use of clandestine radio electrical installations will be punishable by fine up to 20,000 bolivares and also by Government confiscation of apparatus and instruments: without predjuice to a prosecution that might be taken up, when besides infringing these conditions the fact constitutes an offence against the security of the State or the Constitutional Powers.

SECOND SECTION.—INSTRUCTIONS.

ART. 48.—By separate resolutions the Ministry of Public Works will draw up the instructions to be observed in the radiotelegraph service; it will fix the places where the stations shall be installed; it will grant the permits referred to in Article 8; it will organise the instruction and examination of operators; it will fix bases for bookkeeping, and will prescribe all rules of a technical character that have to be observed in the service.

Given, signed, sealed with the Seal of the Federal Executive and countersigned by the Minister of Public Works, at the Federal Palace, Caracas, on the thirty-first day of the month of January, 1921. The 111th year of Independence and the 62nd of the Federation.

(Place for the Seal.)

V. MARQUEZ BUSTILLOS.

Countersigned.
Seal.

G. TORRES,
The Minister of Public Works.

MINISTRY OF PUBLIC WORKS.
UNITED STATES OF VENEZUELA—MINISTRY OF PUBLIC WORKS—DIRECTION GENERAL OF STATISTICS AND COMMUNICATIONS.

B CARACAS, 31st January, 1921.
111th and 62nd Year.

It is Resolved:

By Order of the Provisional President of the Republic and in conformity with Article 48 of the Radiotelegraphic Regulations for the following to be binding.

INSTRUCTIONS FOR RADIOTELEGRAPHIC STATIONS.
PRELIMINARY REMARKS.

The present instructions contain the rules which must be observed by the Venezuela stations in the execution of the Radiotelegraphic Service.

These rules refer principally:
(1) To the tariff.
(2) To the transmission of radiotelegrams.
(3) To the admission and classification of messages.
(4) To the signals adopted.

Besides the present instructions, the object of which is to facilitate the regularity of the service, the Venezuelan radiotelegraphic stations will be subject to the Law of Telegraphs and Telephones, to the International Telegraphic Convention, and the International Radiotelegraphic Convention, as well as the regulations annexed to these. The said date will furnish the basis for the execution of the service in the International *régime*.

The stations will be also subject to the telegraphic tariff used in Venezuela and to those besides which link up the service with the exterior so as to make up the total rate of each message. Likewise they will be subject to the nomenclature of the radiotelegraphic stations, and finally to all the legal conditions and Venezuelan regulations referring to the radiotelegraphic service.

No. 1.—RADIOTELEGRAPHIC STATIONS.

A. Radiotelegraphic stations are shown in the "nomenclature of radiotelegraphic stations." This nomenclature gives the following particulars in regard to every station:—

(1) For coast stations the name, nationality, and geographical position indicated by the territorial division, and by the longitude and latitude of the place; for ship stations, the name, and nationality of the ship, and in certain cases the name and address of the owner.

(2) The call signal. (The signals are different from one another, and each one is formed by a group of three letters.)

(3) Normal range.

(4) The radiotelegraphic system of transmission (musical spark, tonality expressed by the number of duplicate vibrations, etc.)

(5) Length of waves used. (The length of the normal wave is underlined.)

(6) The nature of the services effected.

(7) The hours of opening.

(8) If the case should arise the hour and method of sending hourly signals and meteorological reports.

(9) The coast and ship tariff.

B. The name of the ship station as shown in the first column of the nomenclature is followed in case of ambiguity by the call signal of the station.

C. The following abbreviations are used in service documents:—

P.G.—Station opened for public correspondence in general.
P.R.—Station opened for restricted public correspondence.
P.—Station opened for private interests.
O.—Station opened only for official correspondence.
N.—Station for permanent service.
X.—Station with no fixed intermission.

D. At coast stations the service will be as far as possible permanent by day and night without interruption. Nevertheless, some stations can carry on a service of limited duration.

Coast stations where the service is not permanent may not suspend their work until having transmitted all their radiotelegrams to the ships which are in the sphere of action, nor until after having received from these ships all the radiotelegrams advised. This condition is likewise applicable when ships signal their presence before the suspension of work has been effected.

E. Ship stations are divided into three categories :—

(1) Stations for permanent service.
(2) Stations for limited service.
(3) Stations with no fixed intermission.

During navigation the following must remain in expectation of reception :—

(1) Stations under the first category.
(2) Those under the second category during service hours, and outside of those hours during the first ten minutes of each hour.

Stations of the third category are not bound by any regular waiting service.

The radiotelegraphic service of the ship station is under the supreme authority of the commander or captain of the ship.

F. Fixed stations of the terrestrial zone are divided according to their purpose into four categories, namely :—

(1) Central station
(2) Local stations.
(3) Training stations.
(4) Portable stations.

G. The central station as regard service is bound by obligations of the coast stations.

Local internal stations, which, on account of their position, are outside of communication with ships, will be worked like ordinary national telegraph offices.

Training and portable stations will be governed by the special provisions concerning them which will be prescribed in each case by separate resolutions.

H. All fixed radiotelegraphic stations will be linked with the telegraphic system of Venezuela. By the latter, radiotelegrams can be sent and received.

No. 2.—RADIOTELEGRAPHIC CORRESPONDENCE.

A. Every person has the right to make use of International radiotelegraphic communication.

The sender of a private telegram is obliged to prove his identity when asked by the office or station of origin.

The right to correspond radiotelegraphically is subject, nevertheless, to the fulfilment of the local regulations and tariffs.

B. The Government does not accept any responsibility by reason of the radiotelegraphic service supplied to private people.

C. The text of the telegram must be written legibly in characters which have their equivalent on the telegraphic signals used in Venezuela. These characters are as follows :—

LETTERS.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z.
ä ñ ö ü.

FIGURES.

1 2 3 4 5 6 7 8 9 0

SIGNS OF PUNCTUATION.

Full stop (.) ; comma (,) ; semi-colon (;) ; colon (:) ; note of interrogation (?) ; exclamation mark (!) ; apostrophe (') ; hyphen (-) ; parenthesis () ; inverted commas (" ") ; oblique (/) underline (__).

D. The various parts of which a telegram is composed should be written in the following order :—

(1) Supplementary instructions.
(2) The address.
(3) The text.
(4) The signature.

E. The sender must write on the form immediately before the address the supplementary instructions.

Multiple radiotelegrams will have this remark written immediately before the addresses concerned.

The remark "Urgent" is not admitted in Venezuela except on the ordinary telegraphic system.

F. Every address must contain at least two words. The first giving the name of the addressee, the second indicating the station of destination. Nevertheless, if the address is lacking in further necessary particulars for the addressee to be traced without difficulty by the office of destination the sender shall abide by the consequences of insufficient address.

G. The address of radiotelegrams destined for ships must be as full as possible. They must necessarily contain :—

(*a*) Name or capacity of the addressee with supplementary particulars if need be.
(*b*) Name of the boat as shown in the first column of the nomenclature.
(*c*) Name of the coast stations as shown in the nomenclature.

Nevertheless, the name of the ship may be substituted at the sender's risk by the route indication and determined by the name of the ports of origin and destination or by some other similar remark.

H. Telegrams without text are admitted.

The text may be written in plain language or in secret language, and in the latter case it may be in code language or in cypher language. Each one of these languages may be used singly or in combination with others in the same telegram.

It can also be written by means of the International Code of signals. The radiotelegraphic station will not translate this text when the telegram has to be retransmitted to another station.

I. The station of origin in Venezuela does not admit messages in secret language except on condition that they fulfil the requirements established in Article 45 of the radiotelegraphic Regulations. This provision is not applicable to transit telegrams.

J. Plain language is understood to be that which suggests an intelligible meaning in one or more of the languages authorised for International telegraphic correspondence.

The use of code addresses, commercial signs, international code signals, abbreviations, initials such as f.o.b., c.i.f., or analogous terms do not deprive the telegram of its plain language character.

K. Code language is composed of words that do not form intelligible sentences.

Words actual or artificial must be pronounceable in Spanish, German, French, Dutch, English, Italian, Portuguese or Latin.

Artificial words must not bear accented letters.

Code language words must not have more than ten characters of the Morse alphabet. The ch or any other combination of vowels or double consonants will be counted as two letters in artificial words.

Words formed by the combination of two or more in plain language against the usage of the language are not admitted.

L. Cypher language is that formed by—

(1) Either Arabic cyphers, groups or series of Arabic numbers with a secret meaning, or by letters (unaccented), groups or series of letters with a secret meaning.

(2) Words, names, expressions or combinations of letters which do not fulfil the conditions of plain language nor of code language

The mixture of cyphers and letters with a secret meaning is not admitted in the same group.

The groups referred to under Paragraph J are not considered to be of secret meaning.

M. The signature is not obligatory; it may be written by the sender in accordance with custom or substituted by a registered address.

It is indispensable for every message to be signed in Venezuela, although the signature need not be transmitted, at any rate the registered address used as the signature must be translated at the foot of the telegram.

No. 3.—OFFICIAL RADIOTELEGRAMS.

A. An official message is understood to be that dealing with matters of public service and sent by a Government official in the exercise of his duties.

B. Official radiotelegrams must bear the seal of or a memorandum from the sending official unless there is no doubt of their authenticity.

C. The right to send a reply as an official radiotelegram is proved by the production of the message requiring it.

D. Official radiotelegrams can in any case be written in secret language.

E. The receiving station must repeat official messages; partially if they are written in plain language, and wholly if in secret language.

No. 4.—SERVICE RADIOTELEGRAMS.

A. Only authorised employees can send service radiotelegrams free. This privilege is limited to radios that present an urgent character and they must be written in a concise form. Exclusive of such cases the station may refuse the message or forward a duplicate by post.

B. Service advices may also be exchanged free of tariff between two or more stations respecting repetitions, rectifications, or cancellation of messages or anything affecting the correct transmission.

C. When the service advice is requested by a private person ir will be charged according to the tariff. In communications with boats the advice may only refer to the rectification of radios previously transmitted. The letters S.T. must precede the preamble of these radiotelegrams. If there should be need to rectify a word it will be indicated by the position it occupies in the text of the message, independent of the rules of taxation.

No. 5.—METHOD OF COUNTING WORDS.

A. All that which the sender writes on the form for transmission is subject to taxation, and is included in the number of words. Hyphens which separate words and signs of punctuation are only transmitted by special request or when they form groups of signs in secret language, and in these cases they are subject to tariff.

B. The name of the station, number of the radiotelegram, time of handing in and other indications in the preamble are not counted or charged unless the sender inserts any of these remarks in the text of his radiotelegram, and then they form part of the number of chargeable words.

C. One word is counted for the following in all languages:—

(1) In the address.

(*a*) The name of the office of destination (or the coast station) written as shown in the first column of the Nomenclature with the relative indications.

(*b*) The names of the territorial subdivisions respectively written in accordance with the Nomenclature.

(2) The name of the ship as shown in the first column of the Nomenclature.

(3) The code words fulfilling the conditions under paragraph K of No. 2.

(4) Every isolated character, letter or cypher, as well as every sign of punctuation, apostrophe or hyphen transmitted at the sender's request.

(5) The underline.

(6) The parenthesis signs.

(7) The inverted commas.

(8) The supplementary instructions.

D. In plain language any word or authorised group containing fifteen letters of the Morse alphabet is reckoned as a single word. Any characters in excess, should there be any, are calculated as an additional word.

In code language every ten characters are counted as one word.

In cypher language every five letters or numbers are counted as one word.

E. If in the same message there should be complete sentences in plain language and in code language or cypher language the words in each sentence will be counted according to the former rule; but if there should be code or cypher words intercepted in the plain language the whole radiotelegram will be considered as cypher, and if without cyphers as code language.

F. Words joined by hyphens and apostrophes will be counted as separated and the syllabic sounds by the number of letters of which they are composed.

G. The combination of words against general usage is not admitted. Usage is justified if the point should arise by reference to a dictionary of the respective language.

H. The counting of words at the station of origin is decisive, but if the office of destination should discover an error it may claim the excess from the addressee, and if the latter should refuse to pay it have a service advice sent for the amount to be collected from the sender. When the latter has paid the difference another service advice will be sent authorising delivery of the message.

No. 6.—TARIFFS AND TAXATION

A. Radiotelegrams originating from a ship are taxed as addressed to the nearest coast station. In the charge the supplementary telegraphic tariff will be included.

B. When the sender gives instructions on his message for the retransmission of the radiotelegram to another station he shall pay the tariff relative to each service. This rule will be applied when the retransmission of a radio

sent by land is effected through two or more ship stations.

C. The total rate for telegrams will be collected from the sender except :—

(1) Express charges.

(2) Porterage charges by the station of destination.

(3) In cases provided for under letter G of this paragraph.

D. The rate will be collected in bolivares, and foreign tariffs will in each case be converted to this currency.

E. Rates will be fixed in accordance with the particulars in the Nomenclature.

F. Ship stations may obtain information from coast stations when they are not in possession of all the necessary particulars for making up the rate of the telegrams.

G. When the transit tax is not shown in the Nomenclature the office of origin will include in the preamble the remark "tax to be collected." The same thing will be done when it is from a sender in a country not adherent to the International Conventions.

H. The sender of the radiotelegram has the right to ask for a receipt with a note of the amount collected. The office of origin may charge a fee for this of 25 cents.

No. 7.—TRANSMISSION OF RADIOTELEGRAMS.

A. The length of a normal wave is 600 metres. Every station must be equipped so as to be able to send waves of 300 metres as well. But it must always be in condition to receive calls made by means of the normal wavelength.

B. Stations intended exclusively for determining the position of ships must not use wavelengths exceeding 150 metres.

C. The foregoing conditions, indispensable to a good public service shall not prevent, if the case should arise, for the Government to make any variations which it may judge convenient for its radiotelegraphic correspondence.

D. Stations must maintain traffic with the least waste of power. Ship stations must not use more than 1 kw. unless the boat is obliged to communicate at a distance exceeding 200 nautical miles, or when exceptional circumstances require an increase in power.

E. The exchange of signals, superfluous words, experimenting or practice, that may disturb the service of other stations is forbidden For this reason training and portable stations will use wavelengths different to the normal.

F. Should the foregoing rules be infringed the station must lodge a complaint in detail to the Direction-General of Federal Telegraphs and Telephones.

No. 8.—TRANSMITTING SIGNALS.

A. The Morse Code signals are used in the service.

B. The spacing and length of the signals is as follows :—

(1) The dash is equal to three dots.

(2) The space between the signals of the same letter is equal to a dot.

(3) A space between two letters is equal to three dots.

(4) A space between two words is equal to fivo dots.

C. Letters are represented by the signal shown in the following table :—

a	· —	n	— ·
ä	· — · —	ñ	— — · — —
á	· — — · —	o	— — —
b	— · · ·	ö	— — — ·
c	— · — ·	p	· — — ·
ch	— — — —	q	— — · —
d	— · ·	r	· — ·
e	·	s	· · ·
é	· · — · ·	t	—
f	· · — ·	u	· · —
g	— — ·	ü	· · — —
h	· · · ·	v	· · · —
i	· ·	w	· — —
j	· — — —	x	— · · —
k	— · —	y	— · — —
l	· — · ·	z	— — · ·
m	— —		

D. The figures are represented as follows :—

1	· — — — —	6	— · · · ·
2	· · — — —	7	— — · · ·
3	· · · — —	8	— — — · ·
4	· · · · —	9	— — — — ·
5	· · · · ·	0	— — — — —

In office repetitions and in the preamble and in cypher telegrams with the remark "in cypher" numbers may be abbreviated as follows :—

1	· —	6	— · · · ·
2	· · —	7	— · · ·
3	· · · —	8	— · ·
4	· · · · —	9	— ·
5	· · · · ·	0	—

E. Signs of punctuation and other indications are represented as follows :—

Punto (.)	· · · · · ·
Coma (,)	· — · — · —
Punto y coma (;)	— · — · — ·
Dos puntos (:)	— — — · · ·
Punto de interrogación o demanda de una transmisión no comprendida (?)	· · — — · ·
Punto de admiración (!)	— — · · — —
Apóstrofe (')	· — — — — ·
Guión (-)	— · · · · —
Raya de fracción (/)	— · · — ·
Paréntesis, antes y después de las palabras ()	— · — — · —
Comillas, antes y después de las palabras (" ")	· — · · — ·
Subrayado antes y después de las palabras o de las frases	· · — — · —
Llamada (preliminar de toda transmisión)	— · — · —
Doble guión (=)	— · · · —
Comprendido	· · · — ·
Error	· · · · · · · ·
Cruz (+)	· — · — ·
Invitación a transmitir	— · —
Espera	· — · · ·
Fin de trabajo	· · · — · —
Señal de siniestro (repetida a cortos intervalos)	· · · — — — · · ·

In the transmssion of fractions, whole numbers should be separated from the fractions

by the double hyphen (=) so as to avoid—*e.g.*, 11/4 being confused with 1=1/4.

F. When a station notices the distress signal ● ● ● ▬ ▬ ▬ ● ● ● it shall suspend all correspondence, and not renew it until having made certain that the communication which originated by the call for help has been concluded.

G. The station which perceived a call for help must obtain all necessary particulars from the ship making the call as regards the order of the communications or the cessation of them.

H. When a signal for help is addressed to a particular station it devolves upon the latter to reply unless it cannot reply. In the absence of a special indication each station is obliged to answer.

I. Stations must alternate in their transmission of radiotelegrams and each series should not exceed fifteen minutes.

J. A transmission begun shall only be suspended in case of absolute urgency.

K. Radiotelegrams of the same category shall be forwarded in the order in which they are handed in.

L. The order of priority is as follows:—

(1) Official radiotelegrams in accordance with the rank of the sending official.

(2) Service radiotelegrams.

(3 Private radiotelegrams.

M. The call signal is composed of the sign ▬ ● ▬ ● ▬ followed by the call repeated three times by the station called, the word "from" and the signal repeated three times from the station calling.

N. The station called replies by the signal ▬ ● ▬ ● ▬ followed by the call signal repeated three times from the station in question by the word "from" its call signal, and the sign ▬ ● ▬

O. As a general rule the ship station is the one that calls the coast station whether the latter should have radiotelegrams to transmit or not.

P. Stations which want to communicate with ships without knowing the names of those in their sphere of action may use the exploration signal ▬ ● ▬ ▬ ● ▬ ● ▬

Q. Every station that is obliged to effect transmission of high power first of all sends the advice signal three times ▬ ▬ ● ● ▬ ▬ with the minimum power required for reaching the neighbouring stations. The high power shall not be begun to be transmitted until thirty seconds after the despatch of the advice signal.

R. If a station cannot reply to a call signal which is repeated three times at intervals of two minutes each, the call cannot be repeated until an interval of fifteen minutes has elapsed. The station calling verifying that there is no other radiotelegraphic communication in progress.

S. The ship station must inform each coast station to whom it has signalled its presence when it proposes to cease operations, and how long the interruption will last.

T. As soon as the coast station has replied the ship station will furnish the information that follows, if it has messages to be transmitted to it, the following information will also be given when the coast station asks for it:—

(*a*) The approximate distance in nautical miles from the ship to the coast station.

(*b*) The position of the ship shown in a concise manner, clear and applicable to the circumstances of the case.

(*c*) The nearest port at which the ship will touch.

(*d*) The number of radiotelegrams, if they are of ordinary length, or the number of words if they are exceptionally long.

The speed of the ship in nautical miles will be specially shown at the particular request of the coast station. The coast station should reply at once and indicate the number of radiotelegrams that it has to transmit.

In case the transmission cannot be made immediately, both should communicate the approximate duration of the time of waiting.

Between two ship stations it devolves upon the station called to fix the order of transmission.

When a coast station receives calls from various ship stations it shall decide the order for reception endeavouring for this purpose to procure from every station taking part the transmission of the greatest number of radiotelegrams.

A telegram which is not in order must not be delayed or refused. It must be received and a request made if necessary by service advice for correction.

U. Before beginning a transmission a ship station shall advise whether it should be done in series or in alternate order; the transmission will then be begun by means of the signal ▬ ● ▬

V. The transmission of the radiotelegram is preceded by the signal ▬ ● ▬ ● ▬ The station proceeds at once with the transmission of the preamble in the following order:—

(*a*) Service remark "radio."

(*b*) Nature of the radiotelegram by one of the remarks S, A, D, according to whether it is an official message, service advice, or a private urgent message.

(*c*) The letter B is only used when the station is in direct communication with the station of destination.

(*d*) Office of origin or ship station.

(*e*) Number of the telegram.

(*f*) Number of changeable words.

(*g*) The time of handing in by two groups of figures: the first showing the day of the month, and the second the hour and minutes.

Ship stations shall show the time by the numbers 0 - 24.

(*h*) The route to be followed will be shown on the form.

(*i*) Service remarks.

W. After the preamble the supplementary instructions, the address, the text and the signature will be consecutively transmitted.

The double hyphen (▬ ● ● ● ▬) is transmitted so as to separate the preamble from the supplementary instructions and the other parts of the telegram.

The transmission concludes with a signal ● ▬ ● ▬ ● followed by the signal of the sending station and by the signal ▬ ● ▬. In the case of a series the signal and the sign ▬ ● ▬ will not be given until the end of the series.

When a radiotelegram contains more than forty words the sending station may interrupt the transmission after every twenty words more or less by means of a sign of interrogation ● ● ▬ ▬ ● ● and will not go on with the transmission until the repetition of the last word has been properly received, followed by a note of interrogation or if the transmission is correct by the signal ▬ ● ▬ If the operator, who is making the transmission, finds that he has made a mistake he will interrupt it by the error signal ● ● ● ● ● ● ●, the last word which was correctly transmitted being repeated and the rectified transmission continued.

In the case of transmission by series the advice of receipt will be given after every radiogram.

The coast stations occupied in transmitting long radiotelegrams must suspend transmission at the end of a period of fifteen minutes, and keep silent for three minutes before continuing the transmission.

X. The advice of receipt will be given by means of the letter R followed by the number of the radiotelegram received. This advice is preceded by the indication signal of the sending station and followed by that of the receiving station.

Y. The conclusion of the operation between two stations is indicated by each one by means of a signal ● ● ● ▬ ● ▬ followed by the relative indication.

Z. When signals are doubtful the radiotelegram may be repeated up to three times. If it is still illegible it is cancelled.

In any case the receiving station can send it to its destination bearing the service mark "reception doubtful."

The sender of a radiotelegram who establishes his identity may cancel it. If it should not have been transmitted the charges will be returned to him with the exception of a tax of 25 cents. bolivares.

If the transmission should have already been effected the cancellation will be made by a taxed service advice.

No. 9.—FORWARDING TO DESTINATION.

A. The sender may order a radio to be sent by telephone. If so, the word "Telephone" shall be written before the address.

B. For despatch to destination radiograms are classified in the same order of priority as for transmission.

C. Radios with the remark "Day" are not delivered during the night; those received during the night are not immediately delivered unless they contain the word "Night," or the receiving station should consider them to be of a real urgent character.

D. The radiogram may be delivered in the absence of the addressee to the members of his family, and to persons in his employ. The remark "M.P." or "manos propias," *i.e.* (own hands), as well as the remark "Open," are only admitted in official correspondence.

E. When the radiograms cannot be delivered the station of destination shall explain the reason by service advice. If need be, a mistake in the address will be corrected.

F. Radiograms not transmitted shall be sent by post to the Direction-General of Federal Telegraphs and Telephones to be filed.

G. When a radiogram has to be transmitted to a boat and the latter is not yet within range of the station, it will be treated like a message not transmitted, the sender being advised on the eighth day unless the latter should order another waiting period of nine days. If the station is sure that the ship has sailed from its range it may cancel the message and advise the sender.

Let it be communicated and published.

By the Federal Executive,

G. TORRES.

VIRGIN ISLANDS

(See LEEWARD ISLANDS.)

WEIHAIWEI

(See CHINA, FOREIGN SETTLEMENTS.)

ZANZIBAR PROTECTORATE

THE Zanzibar Protectorate includes the islands of Zanzibar and Pemba. The main island, which is known as Zanzibar, covering an area of 640 square miles, lies in 6° south latitude, and is separated from the mainland by a channel 22½ miles across at its narrowest part. It was not until during the sixteenth century that the Arabs of the East Coast suceedecd in driving out the Portuguese, and the island was then attached (more or less nominally) to the rulers of Muscat.

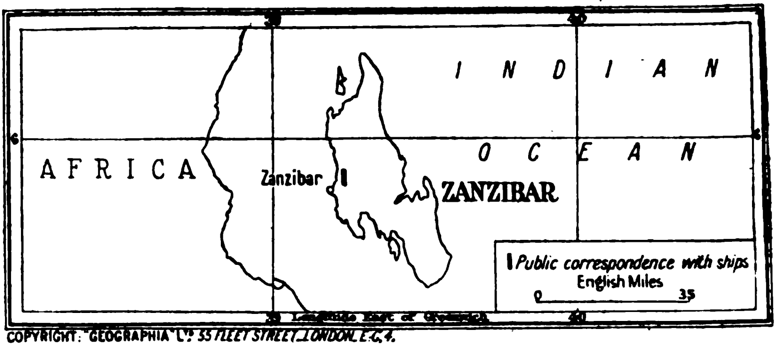
CONTROL.

OFFICIALS CONTROLLING WIRELESS TELEGRAPHY.

Official.	*Title.*	*Address.*
Mr. R. Withycombe, M.B.E. ..	Director of Electricity, Railways, and Wireless Telegraphy	Zanzibar
Mr. S. W. Dyer	Assistant do. do. ..	Zanzibar

ORGANISATION.

The Government maintains wireless stations in Zanzibar, Pemba (see map on p. 554) and Mafia.



Pemba open for Public General Correspondence.

ADMINISTRATION.

We append herewith the Decree issued by the Sultan in 1909 in regard to wireless.

WIRELESS TELEGRAPHY DECREE.
No. 6 of 1909.
In the name of the Most Merciful God.
It is hereby declared as follows :—

1. (1) No person shall establish any wireless telegraph station or instal any apparatus for wireless telegraphy in any place in our dominions except under and in accordance with a license granted in that behalf by our First Minister.

(2) Every such license shall be in such form and for such period as our First Minister may determine, and shall contain the terms, conditions and restrictions on and subject to which license is granted, any such license may include two or more stations or places.

(3) If any person establishes a wireless telegraph station without a license in that behalf or instals or works any apparatus for wireless telegraphy without a license in that behalf, he shall be guilty of an offence against this Decree, and on conviction he shall be liable to a fine not exceeding 1,500 rupees, or to simple imprisonment for a term not exceeding twelve months, or to both, and in either case be liable to forfeit any apparatus for wireless telegraphy installed or worked without a license, but no proceedings shall be taken against any person under this Decree except by the order of our First Minister.

(4) If the Court is satisfied by information on oath that there is reasonable ground for supposing that a wireless telegraph station has been established without a license in that behalf, or that any apparatus for wireless telegraphy has been installed or worked in any place or on board any ship within its jurisdiction without a license in that behalf, it may grant a warrant to any officer of our police to enter and inspect the station or place or ship, and to seize any apparatus which appears to him to be used, or intended to be used, for wireless telegraphy therein.

(5) Our First Minister may make regulations for prescribing the form and manner in which applications for licenses under this Decree are to be made and fees payable on the grant of any such license.

2. Where the applicant for a license proves to the satisfaction of our First Minister that the sole object of obtaining the license is to enable him to conduct experiments in wireless telegraphy, a license for that purpose shall be granted, subject to such special terms, conditions, and restrictions as our First Minister may think proper, but shall not be subject to any rent or royalty.

3. No person shall work any apparatus for wireless telegraphy installed on any ship whilst that ship is in the waters of our dominions otherwise than in accordance with regulations made in that behalf by our First Minister, and our First Minister may by any such regulations impose penalties for the breach of any such regulations not exceeding 150 rupees for each offence, and may provide for the forfeiture on any such breach of any apparatus for wireless telegraphy installed or worked on such ship. Save as aforesaid, nothing in this Decree shall apply to the working of apparatus for wireless telegraphy installed on any foreign ship.

4. The term "ship" includes steamers, sailing ships dhows, lighters, rafts, and every other form of boat. The expression "wireless telegraphy" means any system of communication by telegraph as defined in "The Indian Telegraph Act, 1885" without the aid of any wire connecting the points from and at which the messages or other communications are sent and received.

Provided that nothing in this Decree shall prevent any person from making or using electrical apparatus for actuating machinery or for any purpose other than the transmission of messages.

5. This Decree may be cited as "The Wireless Telegraphy Decree, 1909."

Given under our hand and seal this 9th day of February, 1909.

ALI-BIN-HAMOUD.

Countersigned under the provisions of Article 47 of "The Zanzibar Order in Council, 1906."

JOHN H. SINCLAIR,
British Agent and Consul-General.

DIRECTORY OF THE WORLD'S WIRELESS STATIONS

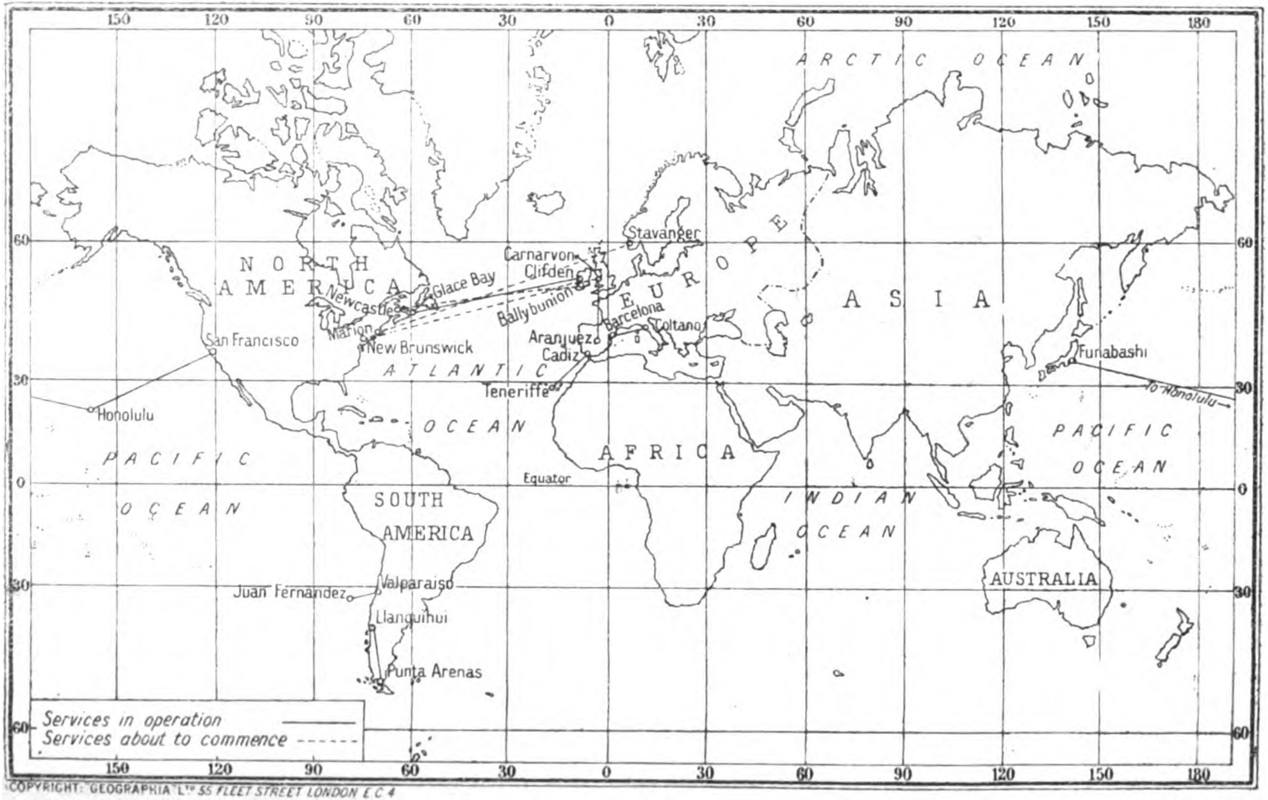
(A) Land Stations.

(B) Shipboard Stations.

(C) International Call Letters.

(D) Alphabetical List of Call Letters.

THE WORLD'S WIRELESS COMMERCIAL SERVICES



WIRELESS TELEGRAPH STATIONS OF THE WORLD

A. Land Stations
B. Ship Stations

THE tables of land stations set out in the following pages should be consulted in conjunction with the maps showing the position of wireless telegraph stations inserted in the Laws and Regulations Section (see pp. 81 to 554). The stations have been grouped together under the names of the countries in which they are situated, and these countries have been arranged in alphabetical order; therefore no difficulty is likely to be experienced in locating any particular station. Avia'ion stations are shown in the apposite section of this volume.

The International Bureau has allotted to signatories of the Convention a list of combinations of letters to be used as call signals for stations proper to the respective countries. The letter limitations of these lists are given in this section, together with the names of the countries with which they are connected.

An alphabetical list of call letters for land and ship stations closes this section. The list indicates upon which page particulars of any station may be found.

Stations of a private or experimental character are omitted, unless exceptional circumstances warrant their inclusion.

Every effort has been made to attain the maximum degree of accuracy possible in these lists, but no responsibility can be accepted, however, in this connection.

A. LAND STATIONS

The following abbreviations are used in the Table of Land Stations below:—(Geographical Position): E—East Longitude; W—West Longitude; N—North Latitude; S—South Latitude. (Nature of Service): P G—General Public Correspondence; P R—Restricted Public Correspondence; O—Official Correspondence; P—Private Correspondence; D F—Direction Finding Service. (Hours of Service): N—Continuous Service; X—No fixed working hours.

N.B.—The times shown are G.M.T. unless otherwise stated.

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
ABYSSINIA										
Gambela	8° 14′ 45″ N. 34° 35′ 30″ E.	GMR	250	Sudan Government	700	P G ..	Weekdays: 0600 to 1300. Frids. & holidays: 0900 to 1100.	—	—	
ADEN										
Aden Radio BZF ..	12° 50′ 00″ N. 45° 00′ 00″ E.	BZF	1,000	British Admiralty	**600**[1]-2,000[3] (spark) 4,000, 4,200 4,500 (arc)	P R[3] ..	N	0.60	—	[1] Other wavelengths are used for official correspondence [2] The station also exchanges public and official correspondence with Berbera Radio (Brit. Somaliland) [3] The station sends out a weather bulletin at 1.30 a.m. and 1.30 p.m. (Greenwich mean time) on a wavelength of 2,000 metres, referring to the meteorological conditions in the eastern portion of the Arabian Sea, the message being prefixed by the words "East Arabian Sea"
Aden Radio VPI ..	Elephant's Back 12° 46′ 00″ N. 45° 03′ 00″ E.	VPI	250	Government ..	**600**	P G[2] ..	N[3]	0.60	—	
ADMIRALTY ISLAND										
Manus Radio ..	2° 01′ 50″ S. 147° 17′ 00″ E.	VZO	200	Australian Government	300, **600**	P G ..	0600 to 0700 0900 to 1000 1300 to 1400 1700 to 2000	0.30[1] 0.60[2]	— —	[1] For radiotelegrams exchanged with ships subject to the administration of Australia or of New Zealand [2] For radiotelegrams exchanged with ships other than those subject to the administration of Austra-

ALASKA										
Akutan	Aleutian Islands 54° 08′ 00″ N.[3] 165° 48′ 00″ W.	KMW	150	North Pacific Sea Products Co.	300, 515, 600	—[1]		X	—	—
Alitak	Kodiak Island 57° 09′ 00″ N.[3] 154° 14′ 00″ W.	KYL	75	Alaska Packers Association	300, 500, 600	P R ..		X	—	—
Anchorage, Alaska ..	61° 16′ 00″ N.[3] 149° 50′ 00″ W.	KZY	150	Alaska Engineering Commissioner.	300, 600, 750, 1,000	O ..		X	—	—
Atka, Alaska ..	—	WJI	—	Bureau of Education.	300, 550, 600, 1,650	P R ..		X	—	—
Becharof, Alaska ..	58° 16′ 00″ N[3] 157° 23′ 00″ W.	KUDV	200	—	300, 500, 600	P R ..		X	—	—
Bristol Bay, Alaska..	58° 45′ 00″ N. 158° 28′ 00″ W.	KMP	20	Alaska Packers Association	300, 500, 600	—[1]		X	—	—
Cape Edwards, Alaska	57° 42′ 00″ N.[3] 137° 15′ 00″ W.	KEY	150	Deep Sea Salmon Co.	300, 550, 600	P R ..		X	—	—
Chicagof, Alaska ..	57° 36′ 30″ N. 136° 09′ 20″ W.	KWW	50	Joseph T. Bauer	300, 550, 600	P ..		X	—	—
Chignik	Alaska Peninsula 56° 17′ 30″ N. 158° 31′ 30″ W.	KHC	300	Alaska Packers Association	300, 500, 600, 1,610	—[1]	April to Oct. X		—	—
Chisik Is., Alaska ..	60° 10′ 00″ N.[3] 150° 25′ 00″ W.	KUCP	300	Surt Packing Co.	300, 550, 600	P R ..		X	—	—
Circle City	65° 49′ 12″ N. 144° 04′ 18″ W.	WVA	150	U.S. Army ..	600, 1,280	P R ..	0800 to 2000		—	—
Clark's Point ..	Bristol Bay 58° 50′ 45″ N. 158° 31′ 30″ W.	KHG	200	Alaska Packers Association	300, 400, 500, 600	P[1] ..		X	—	—
Cordova, Alaska ..	Prince William Sound 60° 27′ 45″ N. 145° 58′ 55″ W.	NPA	500	U.S. Navy ..	300, 600	P G ..		N	0.30	—
Craig, Alaska ..	55° 22′ 00″ N.[3] 133° 15′ 00″ W.	WXO	150	U.S. Army ..	600	P R ..	0800 to 2000		0.25	—
Daly, Alaska ..	158° 32′ 30″ W. 58° 59′ 00″ N.	KDJT	150	Alaska - Portland Packers Assoc.	300, 500, 600	P R ..		X	—	—
Dutch Harbour ..	Aleutian Islands, Unalaska 53° 53′ 14″ N. 166° 32′ 08″ W.	NPR	250	U.S. Navy ..	300, 600	P G ..		N	0.30	—
Egegik	58° 17′ 00″ N.[3] 157° 39′ 00″ W.	KMF	300	Libby, McNeill and Libby	300, 500, 600	P R ..		X	—	—
Ekuk, Alaska ..	58° 42′ 00″ N.[3] 158° 32′ 00″ W.	KMG	300	Libby, McNeill and Libby ..	300, 500, 600	P R ..		X	—	—
Fairbanks, Alaska[1] ..	64° 50′ 17″ N.[3] 147° 42′ 21″ W.	WVB	200	U.S. Army ..	1,500	P R ..	0800 to 2000		—	—
False Pass	55° 08′ 00″ N.[3] 162° 55′ 00″ W.	KJL	250	Sockeye Salmon Co.	300, 525, 600, 2,000	—[1]	0700 to 2200		—	—
Fort Egbert	Eagle 64° 46′ 19″ N. 141° 13′ 48″ W.	WVC	200	U.S. Army ..	1,500	P R ..	0900 to 2000		—	—
Fort Gibbon, Alaska	Tanana 65° 10′ 16″ N. 152° 05′ 21″ W.	WVD	250	U.S. Army ..	2,000	P R ..	0800 to 2000		—	—

[illegible] stations

[1] Approximately

[3] Permanently moored vessel

[4] The long wavelength is used for inland communication

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
ALASKA—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Fort St. Michael ..	St. Michael Island 63° 29′ 15″ N. 162° 00′ 18″ W.	WVE	220	U.S. Army ..	300, **600**, 900, 1,200	P G ..	Local time: 0900 to 2100	0.30	—	
Fort Yukon, Alaska	66° 30′ 00″ N.[2] 145° 40′ 00″ W.	WXX	150	U.S. Army ..	300, **600**, 1,050	P R ..	0800 to 2000	—	—	
Funter, Alaska ..	57° 00′ 00″ N.[2] 135° 00′ 00″ W.	KXK	—	Thinket Packing Co.	300, 550, **600**	P R ..	X	—	—	
Hawk Inlet, Alaska..	58° 05′ 00″ N.[2] 134° 45′ 00″ W.	KKAI	100	P. E. Harris & Co.	300, 550, **600**	P R ..	X	—	—	
Holy Cross, Alaska..	62° 10′ 00″ N.[2] 160° 00′ 00″ W.	WVK	150	U.S. Army ..	300, **600**, 1,000	P R ..	0800 to 2000	—	—	
Hyder, Alaska ..	55° 40′ 00″ N. 130° 10′ 00″ W.	KDFA	200-300	Hyder Townsite & Improvement Co.	300, 550, **600**, 1,610	P G ..	X	0.30	—	
Iditarod	62° 40′ 00″ N.[2] 158° 00′ 00″ W.	WXL	200	U.S. Signal Corps	300, 500, **600**, 1650	P R ..	X	—	—	
Ikatan, Alaska ..	54° 45′ 00″ N.[2] 163° 30′ 00″ W.	KXW	100	Pacific American Fish Co.	550, **600**	P R[1]	X	—	—	
Jualin	58° 56′ 00″ N.[2] 135° 00′ 00″ W.	KJA	225	Jualin Alaska Mines Co.	300, **600**, 1,980	P G ..	X	—	—	
Juneau, Alaska ..	58° 30′ 00″ N.[2] 134° 30′ 00″ W.	NVD	500	North Pacific Sea Products Co.	300, **600**	P G ..	N	0.30	—	
Karluk, Alaska ..	Kodiak Island 57° 35′ 30″ N. 154° 25′ 00″ W.	KYK	25	Alaska Packers Association	300, 500, **600**	P R ..	X	—	—	
Ketchikan	Alexander Archipelago 55° 20′ 45″ N. 131° 38′ 51″ W.	NVH	250	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
King Cove	Alaska Peninsula 55° 05′ 00″ N.[2] 162° 20′ 00″ W.	KJK	250	Pacific · American Fisheries Co.	300, **600**, 1,610	P G ..	1830 to 2130	0.30	—	
Kodiak	Hood Island 57° 46′ 42″ N. 152° 21′ 52″ W.	NPS	250	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
Koggiung KUBX[3] ..	Bristol Bay 58° 45′ 00″ N.[2] 156° 42′ 00″ W.	KUBX	20	Alaska Fishermen's Packing Co.	300, 400, **600**	P R ..	X	0.30	—	
Koggiung KVV ..	Bristol Bay 58° 52′ 30″ N. 156° 55′ 30″ W.	KVV	250	-	300, 450, **600**	P G ..	1830 to 2130	0.30	3.00	

Kussilof	Cook Inlet 60° 24′ 00″ N.[2] 151° 17′ 00″ W.	KKAO	200	Alaska Packers Association	595, 600, 1610	P R[1] ..	Octoter to May X	—	—
Kvichak	59° 03′ 00″ N.[2] 156° 48′ 00″ W.	KHB	200	Alaska Packers Association	300, 450, 600	—[1]	X	—	—
Kwiguk Slough ..	Mouth of Yukon River 62° 50′ 00″ N.[2] 164° 40′ 00″ W.	KOV	250	Carlisle Packing Co.	550, 600, 1,650	P G ..	Closed October to April X	0.30	—
Latouche, Alaska ..	60° 00′ 00″ N.[2] 148° 00′ 00″ W.	KIM	200	Kennecott Copper Corporation	300, 600, 1,650	P G ..	1300 to 1700	0.30	—
Lazy Bay	56° 58′ 00 N.[2] 154° 05′ 00″ W	KEPS	130	AlitackPackingCo.	300, 600, 1,650	P G ..	0800 to 1200 1300 to 1700	—	—
Libbyville, Alaska ..	59° 00′ 00″ N.[2] 158° 30′ 00″ W.	KMT	300	Libby, McNeill and Libby	300, 600, 1,700 2,000	P G ..	X	0.30	—
Livengood, Alaska ..	—	WUV	—	U.S. Signal Corps, War Dept.	—	—	—	—	—
Lockanok, Alaska ..	59° 05′ 45″ N. 156° 37′ 50″ W.	KML	30	North Alaska Salmon Co.	300, 500, 600	—[1]	X	—	—
Lost Harbour, Alaska	54° 15′ 00″ N.[2] 165° 35′ 00″ W.	KWS	200	Alaska Sulphur Co.	300, 550, 600	P R ..	X	—	—
Marshall, Alaska ..	61° 50′ 00″ N. 162° 10′ 00″ W.	KIS	100	Harry G. Watson	550, 1,650	P R[1] ..	X	—	—
McGrath	—	WXV	—	—	—	—	—	—	—
Metha Nelson[3] ..	Bristol Bay 58° 45′ 00″ N.[2] 158° 28′ 00″ W.	KMP	25	—	300, 400, 600	P R ..	X	—	—
Morzhovol, Alaska ..	—	KJL	—	SockeyeSalmonCo.	300, 550, 600	P ..	X	—	—
Nakat Inlet, Alaska..	54° 48′ 00″ N.[2] 131° 41′ 00″ W.	KDW	100	G. W. Hume and Co.	300, 525, 600, 1,700, 2,000	P R ..	X	—	—
Naknek KHT ..	Bristol Bay 58° 43′ 30″ N. 157° 00′ 00″ W.	KHT	300	Alaska Packers Association	300, 500, 600, 1,610	—[1]	April to October X	—	—
Naknek KMK ..	58° 43′ 20″ N.[2] 156° 25′ 00″ W.	KMK	300	Nacknek Packing Co.	300, 500, 600	—[1]	X	—	—
Nelson Lagoon ..	55° 55′ 00″ N.[2] 160° 50′ 00″ W.	KXV	100	Pacific - American Fisheries Co.	550, 600	—[1]	—	—	—
Nixon Fort, Alaska..	62° 52′ 00″ N. 155° 30′ 00″ W.[2]	KDRY	300	Alaska Treadwell Gold Mining Co.	300, 600, 1,650	P R ..	X	—	—
Nome, Alaska ..	Norton Sound 64° 30′ 20″ N. 165° 23′ 33″ W.	WVG	500	U.S. Army ..	600, 2,500, 3,000[4]	P G ..	Nov. to May, 0800 to 2000, June to October, N	0.25	—
Nulato	64° 43′ 30″ N. 158° 06′ 48″ W.	WVH	500	U.S. Army ..	1,400	P G ..	0800 to 2000	0.25	—
Nushagak	59° 00′ 00″ N. 158° 30′ 00″ W.[2]	KKAE	300	Libby, McNeill and Libby	300, 600, 1,600	P R ..	X	—	—
Petersburg, Alaska ..	Alexander Archipelago 56° 48′ 44″ N. 133° 57′ 06″ W.	WVI	100	U.S. Army ..	500	P G ..	0800 to 2000	0.25	—

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks
ALASKA—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Pilot Point, Alaska	57° 33′ 00″ N.[2] 157° 36′ 00″ W.	KUDT	200	Alaska Packers Association	300, 500, **600**	P R	X	—	—	
Pirate Cove, Alaska	55° 21′ 50″ N.[2] 160° 21′ 40″ W.	KOXN	500	Union Fish Co.	300, **600**, 1,650	P R	X	—	—	
Port Althorp	58° 08′ 00″ N.[2] 136° 15′ 00″ W.	KLW	250	Deep Sea Salmon Co.	300, 450, 525, **600**	P R	X	—	—	
Port Beauclaire	56° 18′ 00″ N.[2] 133° 54′ 00″ W.	KWO	100	Beauclaire Packing Co.	300, 550, **600**	P R	X	—	—	
Port Chatham	55° 35′ 00″ N.[2] 132° 30′ 00″ W.	KWH	—	Alaska Ocean Food Co.	—	—	—	—	—	
Port Moller	55° 50′ 00″ N. 160° 40′ 00″ W.	KWR	250	Pacific-American Fisheries	300, 450, **600**, 1,610	P G	1830 to 2130	0.30	—	
Port Walter	56° 20′ 00″ N. 134° 40′ 00″ W.	KEQ	100	Alaska Herring and Sardine Co.	300, 500, **600**, 1,625	P G	X	0.30	—	
Radioville, Alaska	—	KWW	—	—	—	—	—	—	—	
Ruby, Alaska	58° 50′ 00″ N. 157° 02′ 00″ W.[2]	KDRH	15	Alaska Packers Association	300, 400, **600**	P R	X	—	—	
Saltchuck, Alaska	55° 35′ 00″ N.[2] 132° 30′ 00″ W.	KWQ	100	H. R. Chilberg	300, 550, **600**	P R	X	—	—	
Seward, Alaska	60° 07′ 00″ N.[2] 149° 24′ 00″ W.	NPV	500	U.S. Navy	300, **600**	P G	N	0.30	—	
Sitka, Alaska	57° 02′ 58″ N. 135° 20′ 55″ W.	NPB	250	U.S. Navy	300, **600**	P G	N	0.30	—	
Snag Point	Alexander Archipelago 59° 02′ 30″ N.[2] 158° 27′ 15″ W.	KHF	200	Alaska Packers Association	300, 400, 500, **600**	—[1]	April to October X	—	—	
St. George, Alaska	Pribilof Islands 56° 36′ 00″ N.[2] 169° 43′ 00″ W.	NPY	100	U.S. Navy	300, **600**	P G	N	0.30	—	
St. Michael	63° 40′ 00″ N.[2] 162° 10′ 00″ W.	WVE	200	U.S. Army	**600**, 900	P G	Nov. to May, 0800 to 2000 June to October, N	0.25	—	
St. Paul, Alaska	Pribilof Islands 57° 07′ 20″ N. 170° 16′ 20″ W.	NPQ	250	U.S. Navy	300, **600**	P G	N	0.30	—	
Sulzer, Alaska	55° 14′ 20″ N. 132° 37′ 40″ W.	KKAA	25	Charles A. Sulzer	300. 550, **600**	P R	X	—	—	

Tenakee	57° 3[illegible] N. 135° 00' 00" W.	K[illegible]	[illegible]00	Columbia Salmon Co.	300, 550, [illegible]	P G ..	X	—	—	
Ugashik, Alaska ..	57° 34' 38" N.[3] 157° 35' 00" W.	KMU	70	Red Salmon Canning Co.	300, 500, 600	—[1]	X	—	—	
Unga Island, Alaska	55° 20' 45" N. 160° 38' 39" W.	KVI	500	Alaska Codfish Co.	300, 550, 600, 1,800	P R ..	X	—	—	
Uyak, Alaska ..	Kodiak Island, 57° 37' 30" N.[3] 153° 59' 40" W.	KHA	300	—	300, 500, 600, 1,610	P[1] ..	X	—	—	
Warren, Alaska ..	156° 56' 00" W. 58° 42' 00" N.	KDJU	150	Alaska - Portland Packers Assn.	300, 500, 600	P R ..	X	—	—	
Washington Bay, Alaska	56° 40' 00" N. 134° 15' 00" W.	KQS	200	Petersburg Packing Co.	300, 550, 600, 1,650	P R ..	X	—	—	
Wrangell	Alexander Archipelago 56° 28' 19" N. 132° 30' 12" W.	WVJ	100	U.S. Army ..	475	P G ..	0800 to 2000	0.25	—	
Yakutat, Alaska ..	59° 34' 00" N.[3] 139° 46' 00" W.	KKA	500	Libby, McNeill and Libby	300, 550, 600	P R ..	X	—	—	
ALGERIA										
Alger T.S.F. ..	To the east of Algiers 36° 45' 00" N. 3° 11' 00" E.	FFA	400	Postal, Telegraph and Telephone Administration	300, 600	P G ..	N	0.40[1]	—	[1] The coast charge is reduced to fr. 0.15 per word for correspondence with ships engaged in a regular service between France and Corsica, Algeria, Tunis
Djidjelli-Gonio ..	36° 49' 10" N. 5° 46' 12" E.	FEJ	—	Navy	450	D F ..	N	—	—	[2] Under construction
Oran, Ain el Turck ..	To the west of Oran 35° 45' 00" N. 0° 45' 30" W.	FUK	300	Navy	300, 600	P G ..	N	0.40[1]	—	[3] A charge of fr. 6 will be made for each bearing. The French State accepts no responsibility on account of the radio compass work
Saida[2]	—	—	—	—	—	—	—	—	—	
ANGOLA (Portuguese West Africa)										
Cabinda	5° 32' 00" S. 12° 11' 00" E.	CRC[3]	250	Government ..	600, 900, 1,200	P G ..	0700 to 1100 1400 to 1700 Sundays and Holidays,	0.40	—	[1] Under construction [2] Working provisionally [3] Provisional
Camaxilo[1]	—	—	—	Government ..	—	—	0700 to 1100	—	—	
Cangamba[1]	—	—	—	Government ..	—	—	0700 to 1100	—	—	
Caquingue[1]	—	—	—	Government ..	—	—	0700 to 1100	—	—	
Cuangar[1]	—	—	—	Government ..	—	—	0700 to 1100	—	—	
Cuanhama[1]	—	—	—	Government ..	—	—	0700 to 1100	—	—	
Cuito Cuanavale[1] ..	—	—	—	Government ..	—	—	0700 to 1100	—	—	
Dirieo[1]	—	—	—	Government ..	—	—	0700 to 1100	—	—	
Encoge[1]	—	—	—	Government ..	—	—	0700 to 1100	—	—	
Huambo	12° 45' 00" S. 15° 49' 00" E.	CRH[3]	250	Government ..	600, 900, 1,200	P G ..	0700 to 1100	—	—	
Loanda[2]	8° 48' 30" S. 13° 15' 18" E.	CRL[3]	750	Government ..	600, 900, 1,200, 1,800, 2,400	P G ..	0700 to 1100	0.40	—	
Lobito[2]	12° 18' 50" S. 13° 35' 30" E.	CRO[3]	250	Government ..	600, 900, 1,200	P G ..	0700 to 1100	0.40	—	

Land Stations—Continued

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
ANGOLA—*contd.*	Meridian of Greenwich							Francs.	Francs.	
Lubango [1]	—	—	—	Government	—	—	0700 to 1100	—	—	
Luio [1]	—	—	—	Government	—	—	0700 to 1100	—	—	
Malange [1]	—	—	—	Government	—	—	0700 to 1100	—	—	
Maquela [1]	—	—	—	Government	—	—	0700 to 1100	—	—	
Mossamedes	15° 11′ 13″ S. 12° 09′ 17″ E.	CRM [8]	250	Government	**600**, 900, 1,200	P G	0700 to 1100	0.40	—	
Moxico [1]	—	—	—	Government	—	—	0700 to 1100	—	—	
Mulondo [1]	—	—	—	Government	—	—	0700 to 1100	—	—	
Novo Redondo [2]	11° 07′ 00″ S. 13° 54′ 00″ E.	CRN [8]	250	Government	**600**, 900, 1,200	P G	0700 to 1100	0.40	—	
Posto A [1]	—	—	—	Government	—	—	0700 to 1100	—	—	
Quanza [1]	—	—	—	Government	—	—	0700 to 1100	—	—	
Quati [1]	—	—	—	Government	—	—	0700 to 1100	—	—	
San Thome Island [1]	0° 05′ 00″ N. 6° 33′ 00″ E.	—	—	Government	600, 1,200, 2,400	—	0700 to 1100	—	—	
Saurimo [1]	—	—	—	Government	—	—	0700 to 1100	—	—	
ANNAM (See **FRENCH INDO-CHINA**)										
ARGENTINA							Mean Time of the Meridian of Cordoba [1]			
Año Nuevo	Año Nuevo Island 54° 39′ 25″ S. 64° 03′ 10″ W.	LIO	432	Navy	**600**, 1,800	P G	1800 to 0600	—	—	
Buenos Aires	—	LIA	—	Navy	—	—	—	—	—	
Cabo de las Virgenes	Entrance to the Strait of Magellan 52° 20′ 00″ S. 68° 22′ 00″ W.	LJE	270	Navy	300, **600**	P G	N	0.60	6.00	
Colegio Militar	Buenos Aires 34° 34′ 00″ S. 58° 33′ 00″ W.	LNG	40	Army	400	O	X	—	—	
Comando 1ra Division Ejercito	B.A. 34° 34′ 00″ S.	LNR	40	Army	400	O	X	—	—	

[1] Mean time of the meridian of Cordoba, 4 hours 16 minutes, 48.22 seconds later than Greenwich time
[2] Time signals transmitted daily. For full particulars see International Time and Weather Signals—Argentina
[3] Lighthouse
[4] Interior station
[5] The working of the station is temporarily suspended

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10
Comando e de Division Ejercito ..	[illegible] W.	LNS	40	Army	400	O ..	X	—	—
Comodoro Rivadavia	Gulf of St. George 45° 49′ 00″ S. 67° 35′ 00″ W.	LIJ	275	Navy	300, 600	P G ..	N	0.60	6.00
Cordoba, Argentina ..	Cordoba 31° 26′ 00″ S. 64° 11′ 00″ W.	LNC	1000	Army	—	O ..	X	—	—
Corrientes LIG ..	—	LIG	—	Navy	—	—	—	—	—
Corrientes LPC ..	27° 27′ 52″ S. 58° 50′ 38″ W.	LPC	100	—	1,000	O	X	—	—
Dársena Norte ..	North entrance to the Port of Buenos Aires 34° 35′ 35″ S. 58° 22′ 10″ W.	LIH	432	Navy	600, 1,000	P G[3] ..	N	0.60	6.00
Direccion General de Arsenales de Guerra	B.A. 34° 38′ 00″ S. 58° 24′ 00″ W.	LNA	40	Army	400	O ..	X	—	—
Eldorado, B.A. ..	—	LIT	—	Navy	—	—	—	—	—
El Palomar, B.A. ..	B.A. 34° 36′ 00″ S. 58° 36′ 00″ W.	LND	40	Army	400	O ..	X	—	—
Faro San Antonio ..	B.A. 36° 18′ 24″ S. 56° 46′ 25″ W.	LJA	—	Navy	—	—	—	—	—
Formosa, Argentina [4]	Government of Formosa 26° 14′ 00″ S. 58° 07′ 00″ W.	LIU	270	Navy	450, 600	P G ..	0700 to 2400	0.60	6.00
Gallegos	—	LIC	—	Navy	—	—	—	—	—
Interseccion Rio de la Plata Ponton	Anchored near buoy K 37 of the port of Buenos Aires	LJL	30	Navy	300, 600	O ..	X	—	—
Liniers	B.A. 34° 38′ 00″ S. 58° 33′ 00″ W.	LNL	40	Army	400	O ..	X	—	—
Martin Garcia ..	34° 11′ 09.1″ S. 58° 15′ 26.8″ W.	LIY	100	Navy	300, 600	P G ..	N	0.60	6.00
Mendoza	Mendoza 32° 54′ 00″ S. 68° 50′ 00″ W.	LNM	400	Army	600, 1,200	O ..	X	—	—
Paraná	31° 42′ 00″ S. 60° 29′ 00″ W.	LPB	300	—	600	O ..	X	—	—
Paz, Entre Rios (La)	Province of Entre Rios 30° 44′ 00″ S. 59° 39′ 00″ W.	LIW	270	Navy	450, 600	P G ..	0700 to 2400	0.60	6.00
Pontón Practicos Recalada	Río de la Plata 35° 10′ 20″ S. 56° 18′ 30″ W.	LIV	150	—	300, 600	P G ..	X	0.60	6.00
Posadas Misiones [4] ..	27° 22′ 00″ S. 55° 54′ 00″ W.	LIQ	270	Navy	300, 600	P G ..	0700 to 2400	0.60	6.00

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
ARGENTINA—*contd.*	Meridian of Greenwich							Francs.	Francs.	
Practicos Recalada Rio de la Plata Ponton	35° 10′ 20″ S. 58° 18′ 30″ W.	LJK	100	Navy	300, **600**	P G ..	X	0.60	6.00	
Puerto Aguirre [4] ..	Rio Iguazú 25° 35′ 00″ S. 54° 35′ 00″ W.	LIS	270	Navy	300, **600**	P G ..	0700 to 2400	0.60	6.00	
Puerto Bermejo ..	26° 56′ 25″ S. 58° 35′ 35″ W.	LPD	100	—	700	O ..	X	—	—	
Puerto Militar ..	B.A. 38° 53′ 15″ S. 62° 06′ 15″ W.	LII	432	Navy	**600**, 1,000	P G ..	N	0.60	6.00	
Punta Delgada, Chubut	Valdes Peninsula 42° 45′ 59″ S. 63° 38′ 22″ W.	LJC	270	Navy	300, **600**	P G ..	N	0.60	6.00	
Punta Mogotes ..	B.A. 38° 05′ 25″ S. 57° 32′ 45″ W.	LJB	270	Navy	300, **600**	P G ..	N	0.60	6.00	
Recalada Bahia Blanca Ponton Faro	Entrance to Bahia Blanca 39° 11′ 00″ S. 61° 39′ 00″ W.	LJM	50	Navy	300, **600**	O ..	X	—	—	
Rio Grande, Tierra del Fuego	Tierra del Fuego 53° 47′ 10″ S. 67° 45′ 50″ W.	LJF	270	Navy	300, **600**	P G ..	2400 to 1200	0.60	6.00	
Rio Santiago, Buenos Aires	34° 50′ 20″ S. 57° 53′ 45″ W.	LIZ	270	Navy	600	O ..	N	—	—	
Rosario de Santa Fé	32° 52′ 00″ S. 60° 39′ 00″ W.	LPA	100	—	900	O ..	X	—	—	
San Julian, Santa Cruz	49° 18′ 30″ S. 67° 42′ 53″ W.	LJD	270	Navy	300, **600**	P G ..	N	0.60	6.00	
Trelew	—	LIB	—	Navy	—	—	—	—	—	
Tucuman	Tucuman 26° 51′ 00″ S. 65′ 18′ 00″ W.	LNT	1,000	Army	—	O ..	X	—	—	
Ushuaia	Tierra del Fuego 54° 49′ 20″ S. 68° 19′ 00″ W.	LIK	324	Navy	300, **600**	P G ..	N	0.60	6.00	
Zarate, Buenos Aires	34° 06′ 00″ S. 59° 02′ 00″ W.	LIX	270	Navy	**600**, 800	O ..	X	—	—	

Adelaide Radio ..	South Australia 34° 52′ 00″ S. 138° 31′ 00″ E.	VIA	450	Government ..	300, 450, 600	P G[4] ..	N	0.30[13] 0.60[23]	—
Brisbane Radio ..	Queensland 27° 25′ 40″ S. 153° 07′ 55″ E.	VIB	450	Government ..	300, 450, 600	P G ..	N	0.30[13] 0.60[23]	—
Broome Radio ..	Western Australia 18° 00′ 00″ S. 122° 25′ 00″ E.	VIO	450	Government ..	300, 450, 600	P G[5] ..	N	0.30[13] 0.60[23]	—
Cooktown Radio ..	Queensland 15° 28′ 00″ S. 145° 15′ 00″ E.	VIC	450	Government ..	300, 450, 600	P G[5] ..	0600 to 2000[15]	0.30[13] 0.60[23]	—
Darwin Radio ..	Northern Territory 12° 27′ 00″ S. 130° 48′ 00″ E.	VID	450	Government ..	300, 450, 600	P G[5] ..	N	0.30[13] 0.60[23]	—
Esperance Radio ..	Western Australia 33° 51′ 00″ S. 121° 53′ 00″ E.	VIE	450	Government ..	300, 450, 600	P G[5] ..	0600 to 2000[10]	0.30[13] 0.60[23]	—
Flinders Island Radio	Tasmania 40° 01′ 00″ S. 147° 52′ 00″ E.	VIL	450	Government ..	300, 450, 600	P G[5] ..	0900 to 1200 1400 to 1800[15] Sundays & public holidays: Closed	0.30[13] 0.60[23]	—
Geraldton Radio ..	Western Australia 28° 47′ 00″ S. 114° 36′ 30″ E.	VIN	450	Government ..	300, 450, 600	P G[4] ..	0600 to 2000[10]	0.30[13] 0.60[23]	—
Hobart Radio ..	Tasmania 42° 52′ 00″ S. 147° 19′ 00″ E.	VIH	300	Government ..	300, 450, 600	P G[3] ..	0600 to 2000[15]	0.30[13] 0.60[23]	—
King Island Radio	Tasmania 39° 55′ 00″ S. 143° 51′ 00″ E.	VZE	200	Government ..	300, 450, 600	P G ..	0900 to 1200 1400 to 1800 Sundays & public holidays: Closed	0.30[13] 0.60[23]	—
Macquarie Island Radio	54° 31′ 00″ S. 158° 57′ 00″ E.	VIQ	300	Government ..	300, 450, 600	P G[8] ..	1800 to 2400[14]	0.30[13] 0.60[23]	—
Melbourne Radio ..	Victoria 37° 50′ 00″ S. 144° 58′ 45″ E.	VIM	450	Government ..	300, 450, 600	P G[3,4]	N	0.30[13] 0.60[23]	—
Misima	10° 40′ 00″ S. 152° 50′ 00″ E.	—	—	—	—	—	—	—	—
Perth Radio ..	Western Australia 32° 02′ 00″ S. 115° 51′ 00″ E.	VIP	400[11] 1,250[12]	Government ..	300, 450, 600, 2,500	P G[3,5,4]	N	0.30[13] 0.60[23]	—
Port Moresby ..	9° 28′ 00″ S. 147° 09′ 00″ E.	—	—	—	—	—	—	—	—
Rockhampton Radio	Queensland 23° 24′ 00″ S. 150° 33′ 00″ E.	VIR	450	Government ..	300, 450, 600	P G[5] ..	0600 to 2000[15]	0.30[13] 0.60[23]	—

[1] For radiotelegrams exchanged with ships subject to the administration of Australia or of New Zealand

[2] For radiotelegrams exchanged with ships other than those subject to the administration of Australia or of New Zealand

[3] Meteorological forecasts are transmitted free of charge by coast stations at the following hours (Melbourne time): Adelaide Radio, 1900 and 2030; Melbourne Radio, 1930 and 2100; Sydney Radio, 2000 and 2130; Hobart Radio, 2200; Brisbane Radio, 2230 and 2300

[4] The station transmits time signals (see International Time and Weather Signals)

[5] The station transmits weather forecasts when necessary or when requested by vessels

[6] Connected with the International Telegraph System by wireless through Melbourne Radio

[7] In the case of radiotelegrams originating at or intended for Flinders Island the charge for local delivery is included in the coast tax

[8] The working of the station is temporarily suspended

[9] Connected with the International Telegraph system by wireless through Hobart Radio

[10] Mean time of the meridian 120° E. of Greenwich

[11] With wavelength of 600 metres

[12] With wavelength of 2,500 metres

[13] Connected with the International Telegraph

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
AUSTRALIAN COMMONWEALTH—*contd.*										
Samaria	10° 36′ 49″ S. 150° 39′ 46″ E.	—	—	—	—	—	—	—	—	system by wireless through Townsville Radio
Sydney Radio ..	New South Wales 33° 40′ 00″ S. 151° 00′ 00″ E.	VIS	400 [11] 1,250 [12]	Government ..	300, 450, **600**, 2,500	P G [8] ..	N	0.30 [12] 0.60 [13]	—	[14] Mean time of the meridian 142° 30′ E. of Greenwich
Thursday Island Radio	Queensland Torres Strait 10° 35′ 00″ S. 142° 13′ 00″ E.	VII	500	Government ..	300, 450, **600**	P G [5] ..	N	0.30 [12] 0.60 [13]	—	[15] Mean time of the meridian 150° of Greenwich E.
Townsville Radio ..	Queensland 19° 15′ 00″ S. 146° 50′ 00″ E.	VIT	1,000	Government ..	300, 450, **600**	P G [5] ..	N	0.30 [12] 0.60 [13]	—	[16] Monday, Tuesday, Thursday, Friday and Saturday, 0900 to 1200, 1400 to 1800; Wednesday, 0900 to 1300; Sunday, closed (mean time of the meridian, 142° 30′ E. of Greenwich)
Woodlark Island ..	Off New Guinea 9° 05′ 00″ S 152° 45′ 00″ E.	VIF	—	Government ..	—	P G [16] ..	—	0.30 [12] 0.60 [13]	—	
Wyndham Radio ..	Western Australia 15° 35′ 00″ S. 128° 18′ 00″ E.	VIW	450	Government ..	300, 450, **600**	P G [5] ..	0900 to 1800 Closed Sundays	0.30 [12] 0.60 [13]	—	[17] Monday to Friday 1000 to 1200 and 1400 to 1600; Saturday, 1000 to 1200; Sunday, closed (mean time of the meridian 142° 30′ E. of Greenwich)
AUSTRIA										
Bregenz [1]	—	—	—	Government ..	—	—	—	—	—	[1] Under construction
Deutsch-Altenburg ..	—	OHB	—	Government ..	3,750, 5,000, 7,500 (c.w.)	—	—	—	—	
Graz [1]	—	—	—	Government ..	—	—	—	—	—	
Innsbruck [1]	—	—	—	Government ..	—	—	—	—	—	
Klagenfurt [1] ..	—	—	—	Government ..	—	—	—	—	—	
Laaerberg	—	OHL	—	Government ..	6,500, 9,000 (c.w.)	—	—	—	—	
Linz [1]	—	—	—	Government ..	—	—	—	—	—	
Salzburg [1]	—	—	—	Government ..	—	—	—	—	—	
AZORES										
Corvo	39° 40′ 10″ N. 31° 07′ 35″ W.	PQC	65	Government ..	300, **600** [1]	— [2]	— [3]	—	—	[1] The station only uses, provisionally, the wavelength of 300 metres

Faial	38° 38′ 00″ N. 28° 44′ 10″ W.	PQH	130	Government ..	300, 600 [1]	P G [4] ..	N	0.40	—	[1] The station only corresponds with the radiotelegraphic stations situated in the Azores [2] Greenwich time: October to March, 0800 to 1700; holidays, 0800 to 1300. April to September, 0800 to 1400, 1500 to 1900; holidays, 0800 to 1300 [4] The station also exchanges radiotelegrams with the other coast stations situated in the Azores, within its radius of operation [5] Used for correspondence with fixed stations
Flores	39° 27′ 35″ N. 31° 08′ 10″ W.	PQF	130	Government ..	300, 600 [1]	P G [4] ..	N	0.40	—	
Ponta Delgada ..	37° 47′ 00″ N. 25° 40′ 00″ W.	BWP	—	Admiralty ..	600	—	—	—	—	
Santa Maria	36° 59′ 55″ N. 25° 08′ 20″ W.	PQK	65	Government ..	300, 600 [1]	P G [4] ..	N	0.40	—	
San Miguel	37° 44′ 30″ N. 25° 42′ 50″ W.	PQM	65	Government ..	300, 600 [1]	P G [4] ..	N	0.40	—	
Terceria	38° 39′ 55″ N. 27° 07′ 34″ W.	PQT	400	Government ..	300, 600, 900,[5] 1,000 [5]	P G ..	N	0.40	—	
BAHAMAS							Mean Time of the Meridian 75° W. of Greenwich.			
Governors Harbour Eleuthera Island	76° 16′ 00″ W. 25° 12′ 00″ N.	VSE	100	—	300, 600	P G ..	0700 to 2300	0.30	—	[1] In the case of radiotelegrams originating at or intended for Nassau the local land line charge is included in the coast tax
Nassau, Bahamas ..	25° 05′ 00″ N. 77° 22′ 30″ W.	VPN	400	Government ..	300, 600, 1,800	P G ..	0700 to 2400	0.30 [1]	3.00 [1]	
BARBADOS (See **BRITISH WEST INDIES**)										
BELGIAN CONGO ..										
Banana	Lower Congo 5° 59′ 35″ S. 12° 20′ 02″ E.	ONA	400–1,000	Belgian Congo ..	300, 600, 2,250	P G ..	0700 to 1130, 1400 to 1700 [1] Holidays: 0700 to 1030 1600 to 1700 [1]	0.30	—	[1] The hours are extended on the dates of arrival and departure of the regular steamers [2] Inland station [3] Open for public correspondence in the inland service [4] Provisional
Basankusu [2] ..	District of Lulonga 1° 14′ 05″ N. 19° 46′ 00″ E.	OQU	300	Belgian Congo ..	2,100	—[3]	0700 to 1130 1400 to 1700 Sundays and holidays: 0700 to 1030 1600 to 1700	—	—	
Basoko [2]	Aruwimi 1° 14′ 00″ N. 23° 36′ 00″ E.	OQO	300	Belgian Congo ..	2,550	—[3]	Ditto	—	—	
Boma [2]	Lower Congo 5° 51′ 00″ S. 13° 06′ 00″ E.	OQB	300	Belgian Congo ..	2,100	—[3]	Ditto	—	—	
Bunia-Kilo [2] ..	1° 42′ 00″ N. 30° 00′ 00″ E.	BIA [4]	300	Belgian Congo ..	4,300	—[3]	Ditto	—	—	
Coquilhatville [2] ..	0° 04′ 00″ N. 18° 18′ 00″ E.	OQC	300	Belgian Congo ..	3,200	—[3]	Ditto	—	—	
Elisabethville [2] ..	Upper Luapula 11° 38′ 00″ S. 27° 31′ 00″ E.	OQH	300	Belgian Congo ..	3,000	—[3]	Ditto	—	—	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
BELGIAN CONGO —*contd.*										
Kikondja [3]	Tanganika Moero 8° 19′ 00″ S. 26° 25′ 00″ E.	OQK	300	Belgian Congo ..	2,400	—[3]	0700 to 1130 1400 to 1700 Sundays and holidays: 0700 to 1030 1600 to 1700	—	—	
Kindu [1]	Maniema 2° 56′ 00″ S. 25° 56′ 00″ E.	OQD	300	Belgian Congo ..	1,950, 2,300	—[3]	Ditto	—	—	
Kinshasha [3]	Middle Congo 4° 18′ 22″ S. 15° 21′ 57″ E.	OQL	300	Belgian Congo ..	3,600	—[3]	Ditto	—	—	
Kongolo [3]	Tanganika Moero 5° 23′ 00″ S. 26° 59′ 00″ E.	OQG	300	Belgian Congo ..	2,700	—[3]	Ditto	—	—	
Lukula [3]	Tanganika Moero 5° 55′ 40″ S. 29° 15′ 00″ E.	LGA [4]	300	Belgian Congo ..	3,800	—	Ditto	—	—	
Lusambo [3]	Sankura 5° 00′ 00″ S. 23° 05′ 00″ E.	OQM	300	Belgian Congo ..	4,000	—[3]	Ditto	—	—	
Stanleyville [3] ..	0° 30′ 00″ N. 25° 14′ 00″ E.	OQS	300	Belgian Congo ..	3,400	—[3]	Ditto	—	—	
Umangi [3]	Bangala 2° 06′ 43″ N. 21° 26′ 52″ E.	OQI	300	Belgian Congo ..	2,750	—[3]	Ditto	—	—	
BELGIUM										
Anvers Radio ..	51° 13′ 42″ N. 4° 24′ 00″ E.	OSA	100–150	Government ..	500, **600**	P G ..	N	0.40 [1]	4.00 [1]	[1] In the communications with the packet boats of the Belgian State making their passage between Ostende and Dover there is no special coast tax. The total wireless tax is 3 francs for 10 words or less, and 20 centimes for each word over ten
Evère (Brussels) ..	—	BAV	—	Army	1,400 (W. Telegraphy) 900 (W. Telephony)	—	—	—	—	
Ostende Radio ..	51° 13′ 24″ N. 2° 55′ 06″ E.	OST	Day 250 Night 500	Government ..	300, 450, **600**	P G ..	N	0.40 [1]	4.00 [1]	
					[illegible]	—	—	—	—	

Bermuda Dockyard Somerset Island ..	32° [illegible]' 00" N. 64° [illegible]' 00" W. 32° 20' 00" N. 64° 25' 00" W.	BZD BZR	[illegible] 500	British Admiralty British Admiralty	600 1,000 ¹	P G .. P R ..	N —	0.60 —	— —	¹ Other wavelengths are used for official correspondence
BOLIVIA										
Ballivián	22° 42′ 00″ S. 62° 11′ 00″ W.	CPA	Day 204	Government ..	600, 900	—	0600 to 0800, 1400 to 1600	—	—	¹ Under construction
Cachuela Esperanza	10° 35′ 00″ S. 65° 40′ 00″ W.	CPJ	90	Government ..	1,000	—	0600 to 0700, 2200 to 2300	—	—	
Cobija	11° 01′ 00″ S. 68° 50′ 00″ W.	CPG	Day 161	Government ..	1,500, 2,600	—	0600 to 0800, 1500 to 1600, 2100 to 2200	—	—	
D'Orbigny	22° 00′ 00″ S. 62° 52′ 00″ W.	CPB	220	Government ..	600, 900	—	0600 to 0800, 1400 to 1600	—	—	
Esteros de Patiño ..	23° 52′ 00″ S. 61° 20′ 00″ W.	CPC	Day 204	Government ..	600, 900	—	0600 to 0800, 1400 to 1600	—	—	
Guayaramerin ..	10° 45′ 00″ S. 65° 25′ 00″ W.	CPK	60	Government ..	1,000	—	0600 to 0700 2200 to 2300	—	—	
Manoa	9° 35′ 00″ S. 65° 20′ 00″ W.	CPL	90	Government ..	1,000	—	0600 to 0700 2200 to 2300	—	—	
Puerto Suarez ¹ ..	18° 55′ 00″ S. 57° 50′ 00″ W.	—	—	Government ..	—	—	—	—	—	
Riberalta	10° 59′ 00″ S. 66° 04′ 00″ W.	CPE	Day 431	Government ..	2,212, 8,811	—	0700 to 1100 2005 to 2400	—	—	
Santa Cruz ¹ ..	17° 40′ 00″ S. 63° 10′ 00″ W.	—	—	Government ..	—	—	—	—	—	
Trinidad	14° 50′ 00″ S. 64° 45′ 00″ W.	CPH	300	Government ..	1,500	—	0700 to 1000 2000 to 2200	—	—	
Viacha	16° 35′ 00″ S. 68° 25′ 00″ W.	CPF	720	Government ..	2,600, 3,300	—	0800 to 1100 2005 to 2400	—	—	
Villa Bella	10° 25′ 00″ S. 65° 25′ 00″ W.	CPI	90	Government ..	1,000	—	0600 to 0700 2200 to 2300	—	—	
Yacuiba	22° 00′ 00″ S. 63° 45′ 00″ W.	CPD	600	Government ..	2,600, 3,300	—	0800 to 1000	—	—	
BORNEO (See **BRITISH BORNEO**)										
BRAZIL										
Abrolhos	Bahia 17° 57′ 30″ S. 38° 41′ 46″ W.	SNN	100	Navy	300	O ..	—	—	—	¹ In the case of radiotelegrams originating at or intended for the places named against the letter in reference, the charge for transmission between such places and the coast station is included in the coast tax (a) Bahia (San Salvador) (b) Rio de Janeiro
Amaralina	Bahia 13° 01′ 00″ S. 38° 28′ 00″ W.	SPA	400	Government ..	300, 600, 1,000 2,000	P G ..	N	0.60 ¹(a)	6.00 ¹(a)	
Anhatomirim ..	S. Catharina 27° 25′ 32″ S. 48° 34 20″ W.	SOD	600	Navy	600, 1,200, 2.000	O ..	—	—	—	
Armação	Rio de Janeiro Bay 22° 52′ 57″ S. 43° 08′ 04″ W.	SNW	50	Navy	300	O ..	—	—	—	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
BRAZIL—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Babylonia	Rio de Janeiro 22° 55′ 40″ S. 43° 10′ 10″ W.	SPY	200	Government	300, **600**	P G	N	0.60[1] (b)	6.00[1] (b)	(c) Rio de Janeiro or Campos
Belém, Para	1° 26′ 59″ S. 48° 30′ 06″ W.	SPB	750	Government	300, **600**, 1,800	P G	N	0.60	6.00	(d) Fernando de Noronha or Recife (Pernambuco)
Cabo de São Thomé	Rio de Janeiro (State) 22° 02′ 00″ S. 40° 58′ 35″ W.	SPT	750	Government	300, **600**	P G	N	0.60[1] (c)	6.00[1] (c)	(e) Pelotas or Rio Grande do Sul (f) Santos (g) Olinda or Recife (Pernambuco)
Cruzeiro do Sul[2]	District of Acre 7° 38′ 28″ S. 72° 36′ 15″ W.	SQC	400	Government	**600**, 3,000	—[3]	1800 to 0600[3]	—	—	[2] Interior station [3] The station is open for public correspondence in the inland service
Escola Naval	23° 00′ 45″ S. 44° 19′ 35″ W.	SOV	50	Navy	300	O	—	—	—	
Escola Radio[4]	Rio de Janeiro 22° 55′ 40″ S. 43° 10′ 10″ W.	SPE	200	—	300, **600**	O	X	0.60	6.00	[4] Instructional station [5] Fifth time belt west of the Greenwich belt
Fernando de Noronha	3° 50′ 30″ S. 32° 25′ 12″ W.	SPN	1,000	Navy	300, **600**, 1,800	O	N	0.60[1] (d)	6.00[1] (d)	[6] Third time belt west of the Greenwich belt
Forteleza da Lage	Rio de Janeiro Bay 22° 56′ 03″ S. 43° 09′ 00″ W.	PTL	150	Navy	450, **600**, 900	O	1100 to 1600 2000 to 2100[5]	—	—	[7] This station transmits a time signal. For full particulars see International Time and Weather Signals
Forteleza de Imbuhy	Rio de Janeiro (State) 22° 57′ 02″ S. 43° 06′ 56″ W.	PTI	150	Navy	450, **600**, 900	O	1100 to 1600 2000 to 2100[7]	—	—	[8] Fourth time belt west of the Greenwich belt
Forteleza de Santa Cruz	Rio de Janeiro Bay 22° 56′ 03″ S. 43° 08′ 00″ W.	PTC	150	Navy	450, **600**, 900	O	1100 to 1600 2000 to 2100[5]	—	—	
Forteleza de S. João	Rio de Janeiro Bay 22° 56′ 40″ S. 43° 09′ 12″ W.	PTJ	150	Navy	450, **600**, 900	O	2000 to 2100[6]	—	—	
Ilha das Cobras	Rio de Janeiro Bay 22° 52′ 00″ S. 43° 09′ 00″ W.	SNI	150	Navy	600	O	—	—	—	

Ilha de Mocangue ..	Rio de Janeiro Bay 22° 52′ 15″ S. 43° 07′ 58″ W.	SOQ	50	Navy	300	O ..	—	—	—
Ilha do Boqueirão ..	Rio de Janeiro Bay 22° 36′ 24″ S. 43° 09′ 39″ W.	SNQ	50	Navy	300	O ..	—	—	—
Ilha de Governador ..	Rio de Janeiro Bay 22° 49′ 25″ S. 43° 07′ 58″ W.	SOH	800	Navy	600, 1,200, 2,000	O ..	—	—	—
Ilha Raza	Entrance to the Bay of Rio de Janeiro 23° 03′ 40″ S. 43° 08′ 45″ W.	SNZ	150	Navy	600	O ..	—	—	—
Juncção	Rio Grande do Sul 32° 04′ 00″ S. 52° 07′ 00″ W.	SPJ	750	Government ..	300, 800	P G ..	N	0.60[1] (e)	6.00[1] (e)
Labrea, Brazil [3] ..	—	SQL	—	Government ..	—	—[3]	N	—	—
Ladario	Matto Grosso	SNU	—	Navy	—	—	—	—	—
Manáos [3]	Amazonas 3° 08′ 05″ S. 60° 01′ 45″ W.	SQM	750	Government ..	2,400, 3,500	—[3]	N	—	—
Mont' Serrat ..	Near Santos 23° 56′ 27″ S. 46° 19′ 34″ W.	SPS	200	Government ..	300, 800	P G ..	0600 to 2400 [6]	0.60[1] (f)	6.00[1] (f)
Natal, Norte ..	Rio Grande do Norte	SNR	500	Navy	600	O ..	N	—	—
Nictheroy	Rio de Janeiro 22° 52′ 52″ S. 43° 07′ 40″ W.	PTN	150	Navy	450, 800, 900	O ..	1100 to 1600 2000 to 2100 [6]	—	—
Olinda, Pernambuco	Near Pernambuco 8° 00′ 35″ S. 34° 51′ 00″ W.	SPO	590	Government ..	300, 800	P G ..	N	0.60[1] (g)	6.00[1] (g)
Porto Velho [3] ..	Matto Grosso 8° 46′ 00″ S. 63° 55′ 00″ W.	SQV	750	Government ..	2,400, 3,500	—[3]	N	—	—
Quartel General ..	Rio de Janeiro 22° 54′ 25″ S. 43° 11′ 30″ W.	PTQ	150	Navy	450, 800, 900	O ..	1100 to 1600 2000 to 2100 [6]	—	—
Rio Branco, Acre [3] ..	9° 58′ 28″ S. 67° 52′ 05″ W.	SQR	210	Government ..	1,000, 2,000	—[3]	1800 to 0600 [6]	—	—
Santarém, Pará [3] ..	2° 24′ 48″ S. 54° 42′ 58″ W.	SQS	400	Government ..	800, 2,000	—[3]	1800 to 0600 [6]	—	—
São Luiz	Maranhao	SOM	250	Government ..	800, 1,000	O ..	0600 to 2400	—	—
Senna Madureira [3] ..	District of Acre 9° 03′ 57″ S. 68° 39′ 35″ W.	SQN	400	Government ..	1,500, 3,000	—[3]	N	—	—
Tarauacá [3]	District of Acre 8° 20′ 55″ S. 70° 43′ 30″ W.	SQT	210	Government ..	1,500, 3,000	—[3]	1800 to 0600 [6]	—	—

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
BRAZIL—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Villa Militar	Rio de Janeiro 22° 49′ 27″ S. 43° 24′ 52″ W.	PTV	150	Navy	450, **600**, 900	O	1100 to 1600 2000 to 2100[3]	—	—	
Villegaignon	Rio de Janeiro Bay 22° 52′ 00″ S. 43° 09′ 40″ W.	SNV	27	Navy	300	O	—	—	—	
Xapury	District of Acre 10° 39′ 10″ S. 68° 36′ 30″ W.	SQX	210	Government	1,000, 2,000	—[3]	1800 to 0600[3]	—	—	
BRITISH BORNEO										
Jesselton	5° 56′ 50″ N. 116° 03′ 10″ E.	VQA	400	Government	300, 450, **600**, 1,200, 2,800	P G[1]	0800 to 1100 1400 to 1700[2] (2000 to 2200)[3]	0.40	—	[1] The station also communicates with other stations in North Borneo [2] Hong-Kong zone time [3] If necessary
Kudat	6° 52′ 40″ N. 116° 50′ 15″ E.	VQD	400	Government	300, 450, **600**, 1,200, 2,800	P G[1]	0800 to 1100 1400 to 1700[2] (2000 to 2200)[3]	0.40	—	
Sandakan	5° 51′ 30″ N. 118° 06′ 40″ E.	VQB	400	Government	300, 450, **600**, 1,200, 2,800	P G[1]	0800 to 1100 1400 to 1700[2] (2000 to 2200)[3]	0.40	—	
Tawao	4° 14′ 40″ N. 117° 54′ 00″ E.	VQC	400	Government	300, 450, **600**, 1,200, 2,800	P G[1]	0800 to 1100 1400 to 1700[2] (2000 to 2200)[3]	0.40	—	
BRITISH EAST AFRICA							Mombasa Time			
Kismayu	0° 21′ 23″ S. 42° 33′ 39″ E.	VQQ	300	Government	**600**	P G	0800 to 1700	0.60	—	
Mombasa	4° 02′ 31″ S. 39° 39′ 10″ E.	VPQ	350	Government	300, **600**, 1,800,	P G	0800 to 1700	0.60	—	
Moyale	—	VQU	—	—	—	—	—	—	—	
Sankuri	—	VQS	—	—	—	—	—	—	—	
Serenli	—	VQR	—	—	—	—	—	—	—	
[illegible]	—	VQ[illegible]								

BRITISH GUIANA										
Demerara	6° 49′ 00″ N. 58° 11′ 17″ W.	BZL	500 [1]	British Admiralty	600, 1,800 [2] 2,200 [2] 4,200 [3]	P R ..	N [4]	0.60	—	[1] 30 kw. spark and 25 kw. arc sets are fitted [2] Transmitting wave to Trinidad 2,200, receiving 1,800 metres [3] Transmitting and receiving wavelength for Jamaica 4,200 with arc set
BRITISH HONDURAS										
Belize	17° 30′ 35″ N. 88° 11′ 17″ W.	VPP	400	Government ..	**600**, 1,000 1,200, 1,800, 2,400	P G [1,3,4]	—	0.53 [2]	5.30 [2]	[1] Traffic for the United States and United Kingdom is handled via the United Fruit Company's station at Swan Island [2] This includes the charge for transmission over the telegraph lines of the colony [3] Commercial traffic is handled during schedule hours, viz.:—0540, 0835, 1040, 1500, 1800 [4] The station sends out weather reports on a wavelength of 1,000 metres daily at 0550 and 1750 (local time) from June to November
BRITISH INDIA										
Bombay Radio ..	72° 54′ 13″ E. 18° 57′ 51″ N.	VWB	350	Indian Government	300, **600** 1,000, 2,000 [1]	P G [1] ..	N [2]	0.60	—	[1] Information regarding weather is broadcasted at 6.30 a.m. and 6.30 p.m. (Indian standard time, 5 hours 30 minutes in advance of Greenwich mean time) on 2,000 metres wavelength [2] During the daytime the station is largely occupied with inland communication [3] Information regarding weather is broadcasted at 7 a.m. and 7 p.m. (Indian standard time, 5 hours 30 minutes in advance of Greenwich mean time) on 2,000 metres wavelength [4] Each weather report from this station is immediately preceded by time signals on the International System [5] Information regarding weather is broadcasted at 7 a.m. and 7 p.m. (Indian
Calcutta Radio ..	88° 20′ 16″ E. 22° 33′ 31″ N.	VWC	350	Indian Government	300, **600** 1,000, 2,000 [3]	P G [2,4]	N	0.60	—	
Diamond Island ..	Mouths of the Irawadi 94° 16′ 51″ E. 15° 51′ 47″ N.	VTD	350	Indian Government	**600**, 1200	P G ..	N	0.60	—	
Karachi Radio ..	Mouths of the Indus 67° 02′ 32″ E. 24° 51′ 05″ N.	VWK	350	Indian Government	300, **600**, 1,000, 2,000 [3]	P G [3] ..	N [3]	0.60	—	
Madras Radio ..	80° 17′ 15″ E. 13° 05′ 00″ N.	VWM	350	Indian Government	300, **600**, 1,000, 2,000 [1]	P G [1] ..	N [3]	0.60	—	
Port Blair	South Andaman Island 92° 45′ 36″ E. 11° 39′ 34″ N.	VTP	350	Indian Government	**600**, 1,200 [5]	P G [5] ..	N	0.60	—	
Rangoon Radio ..	Lower Burma 96° 11′ 42″ E. 16° 45′ 54″ N.	VTR	350	Indian Government	300, **600**, 1,200 [6]	P G [6] ..	N	0.60	—	
[illegible] Island ..	93° 20′ 53″ E.	VTT	250	Indian Government	600	— [7]	X	—	—	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
BRITISH INDIA —*contd.*										
Victoria Point ..	Extreme South of Lower Burma 98° 33′ 15″ E. 9° 59′ 15″ N.	VTV	350	Indian Government	300, **600**, 1,200	P G ..	N	0.60	—	standard time, 5 hours 30 minutes in advance of Greenwich mean time) on 1,200 metres wavelength [6] Information regarding weather is broadcasted at 6.30 a.m. and 6.30 p.m. (Indian standard time, 5 hours 30 minutes in advance of Greenwich mean time) on 1,200 metres wavelength [7] The station only communicates with Diamond Island
BRITISH SOMALILAND										[1] The station also exchanges public and official correspondence with Aden Radio [2] In the case of radiotelegrams neither originating at nor intended for Berbera itself, the coast charge is included in the charge for transmission between Aden and Berbera [3] 3 hours in advance of Greenwich time [4] Temporarily closed [5] Communicates with Berbera and Burao [6] The station only works with fixed stations
Berbera Radio ..	10° 26′ 00″ N. 45° 01′ 30″ E.	VPJ	250	Government ..	300, **600**	P G [1] ..	Mean Time of Aden.[3] 0600 to 1800 2000 to 2030	0.60[2]	—	
Bulhar [4]	10° 22′ 00″ N. 44° 21′ 00″ E.	—	—	Government ..	600	—	—	—	—	
Burao	9° 35′ 00″ N. 45° 33′ 00″ E.	VQX	—	Government ..	600	—	—	—	—	
Hargeisa	9° 30′ 00″ N. 44° 05′ 00″ E.	VSA	—	Government ..	600	—[6]	—	—	—	
Las Dureh	10° 20′ 00″ N. 46° 00′ 00″ E.	VQY	—	Government ..	600	—[5]	—	—	—	
BRITISH WEST INDIES										
Barbados	13° 04′ 35″ N. [illegible] W.	VPO	200	—	300, **600**	P G ..	N	0.60	—	[1] Other wavelengths are fitted for official use only [2] In the case of radio

Christiana, Jamaica	. .	BZQ	500	Admiralty . .	1,200	O . .	—	—	—
Kingston, Jamaica . .	17° 57′ 41″ N. 76° 40′ 39.8″ W.	VQI	100	Direct West India Co.	600	P G . .	X	0.60	6.00
St. Lucia	Windward Islands 13° 50′ 00″ N. 60° 59′ 00″ W.	VQH	250	Government . .	300, **600**	P G . .	X	0.60	—
Tobago	11° 12′ 00″ N. 60° 40′ 00″ W.	VPM	300	Government . .	600	P G [4] . .	Local time 0800 to 1700 2200 to 2215	0.60[2 3]	—
Toco, Trinidad . .	10° 50′ 00″ N. 60° 55′ 00″ W.	VQG	150	Government . .	600	O . .	—	—	—
Trinidad	10° 40 00″ N. 61° 30′ 00″ W.	VPL	350	Government . .	600	P G . .	N	0.60[2 3]	—
BULGARIA									
Varna	43° 12′ 00″ N. 27° 55′ 00″ E.	LZF	270	Government . .	300, **600**	P G . .	0900 to 1200 1400 to 1800 [1]	0.30	3.00
BURMA (See **INDIA**)									
CANADA and NEWFOUNDLAND									
Alert Bay	British Columbia (Cormorant Island) 50° 35′ 20″ N. 126° 55′ 35″ W.	VAF	350	Government, Naval	300, **600**, 1,600	P G [1] . .	N	0.60 [2]	—
American Tickle . .	55° 41′ 00″ N. 53° 28′ 00″ W.	VOC	100	Marconi Co. of Canada	600	—[12]	0800 to 2000[13 14]	0.60	—
Baker's Point, Nova Scotia	Halifax	CKO	—	Government . .	900	—[16]	—	—	—
Barrington Passage . .	Nova Scotia 43° 32′ 40″ N. 65° 39′ 25″ W.	VAL	500, 2,000	Government, Naval	1,600 (spark) 4,000 (arc trans.) 2,200 (arc recep.)	P G [16] . .	N	0.52	—
Battle Harbour . .	52° 17′ 00″ N. 55° 36′ 00″ W.	VOA	150	Marconi Co. of Canada	**300**, 600	—[12]	0800 to 2000[13 14]	0.60	—
Belle Isle	To the North of Newfoundland 51° 52′ 55″ N. 55° 21′ 50″ W.	VCM	250	Marconi Co. of Canada	300, **600**	P G . .	N	0.30	—
Bull Harbour, B.C. . .	Hope Island 50° 55′ 20″ N. 127° 56′ 20″ W.	VAG	450	Government, Naval	300, **600**, 1,600	P G [1] . .	N	0.60 [2]	—

telegrams originating at or intended for Port of Spain (Trinidad), or Scarborough (Tobago), the charge for transmission between the coast station and either of these places is included in the coast charge. Coast station gives any information on charges for other destinations

[3] The coast charge is reduced to 15 centimes per word with a minimum of 1 fr. 50 c. for messages exchanged with the s.s. "Belize," while that vessel is plying between Trinidad and Tobago

[4] The station also exchanges public and official correspondence with Trinidad

[1] Eastern European time

[1] Weather forecasts, transmitted free of charge on request. Messages concerning navigation to any department or officer of the Government handled free of coast tax. Weather and ice reports from captain of a vessel also free of coast charge

[2] For radiotelegrams sent by or addressed to the commander of a ship relating to the service of the ship the coast tax is reduced to fcs. 0.25 per word. The preamble of such messages should contain the service instruction S B

[3] Cape Sable and Sable Island communicate with the land telegraph system through Camperdown

The retransmission charge

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
CANADA and NEWFOUNDLAND—*contd.* Camperdown, Nova Scotia	Halifax 44° 31′ 10″ N. 63° 32′ 40″ W.	VCS	250	Marconi Co. of Canada	300, **600**	P G [13]	N	0.30 [3]	—	
Canso, D F [6] ..	45° 19′ 24″ N. 60° 58′ 25″ W.	VAX	150	—	800	D F [6] P G	N	—	—	
Cape Bear	Prince Edward Island 46° 00′ 45″ N. 62° 27′ 15″ W.	VCP	150	Marconi Co. of Canada	300, **600**	P G [1]	December to March, N April to November, 0800 to 2000 [4]	0.15	—	
Cape Harrison ..	54° 52′ 00″ N. 58° 03′ 00″ W.	VOH	150	Marconi Co. of Canada	600	—[13]	0800 to 2000 [13 14]	0.60	—	
Cape Lazo	Vancouver Island 49° 42′ 20″ N. 124° 52′ 45″ W.	VAC	350	Government, Naval	300, **600**, 1,600	P G [1]	N	0.60 [5 7]	—	
Cape Race	46° 39′ 25″ N. 53° 04′ 15″ W.	VCE	500	Marconi Co. of Canada	300, **600**, 1,600	P G ..	N	0.85	—	
Cape Race D F [6] ..	46° 39′ 10″ N. 53° 05′ 05″ W.	VAZ	250	Canadian Government	800	D F [6] ..	N	—	—	
Cape Ray	—	VCR	—	—	—	—	—	—	—	
Cape Sable	Nova Scotia 43° 23′ 20″ N. 65° 37′ 15″ W.	VCU	250	Marconi Co. of Canada	300, **600**	P G [1 8 11]	N	0.85 [5]	—	
Chebucto Head, D F [6]	44° 30′ 01″ N. 63° 31′ 20″ W.	VAV	150	—	800	D F [6] ..	N	—	—	
Clarke City	Quebec 50° 11′ 00″ N. 66° 37′ 15″ W.	VCK	250	Marconi Co. of Canada	300, **600**	P G [1] ..	N [8]	0.30	—	
Dead Tree Point ..	British Columbia (Graham Island) 53° 21′ 30″ N. 131° 55′ 55″ W.	VAH	200	Government, Naval	300, **600**, 1,600	P G [1] ..	0800 to 1800 [7]	0.60 [3]	—	
Digby Island	British Columbia 54° 17′ 05″ N. 130° 22′ 35″ W.	VAJ	250	Government, Naval	300, **600**, 1,600	P G [1] ..	N	0.60 [3]	—	
Domino	52° 28′ 00″ N. 55° 41′ 00″ W.	VOD	150	Marconi Co. of Canada	600	—[13]	0800 to 2000 [13 14]	0.60	—	
Estevan, British Columbia ..	Vancouver Island 49° 23′ 05″ N. [illegible]	VAE	500	Government, Naval	300, **600**, 1,600	P G [1] ..	N	0.60 [3]	—	

Remarks:

between these stations and Camperdown is fcs. 0.30 per word. This charge is additional to the ordinary radio and land line rates

[4] Atlantic standard time, 4 hours later than Greenwich time

[5] For radiotelegrams sent from or addressed to ships engaged in the local service between Victoria, Vancouver and Seattle, the coast charge is fcs. 0.15 per word. The preamble of such radiotelegrams should contain the service instruction F B

[6] Independent direction finding station

[7] Pacific standard time, 8 hours later than Greenwich time

[8] The station is open only during the season of navigation, approximately April to December

[9] Acts as a retransmitting station for Port Nelson, Manitoba

[10] With the wavelength of 1,800 metres

[11] Transatlantic commercial traffic. Communicates with Clifden (United Kingdom)

[13] The station is open [illegible]

[illegible]	[illegible] 30" W.									[illegible]
Father Point ..	Quebec 48° 31' 00" N. 68° 27' 40" W.	VCF	250	Marconi Co. of Canada	300 600	P G [1] ..	N [6]	0.15	—	[14] The station is only open during the season of navigation, approximately July to October
Fogo	Fogo Island 49° 43' 24" N. 54° 15' 15" W.	VOJ	250	Marconi Co. of Canada	300, 600,	—[12]	0800 to 2000[13]	0.85	—	[15] The station transmits weather forecasts free of charge on request by ship stations
Glace Bay GB ..	Novia Scotia 46° 09' 30" N. 59° 55' 30" W.	GB	3,125	Marconi Co. of Canada	9,000	—[11]	N	—	—	[16] For communication with aircraft
Glace Bay VAS	Nova Scotia 46° 08' 00" N. 59° 55' 00" W.	VAS	—	Marconi Co. of Canada	2800 (c.w.)	Press [18]	—	—	—	[17] Weather, ice and other reports transmitted daily at 0130 and 1330 (G.M.T.)
Gonzales Hill ..	British Columbia, Victoria 48° 24' 50" N. 123° 19' 25" W.	VAK	250	Government, Naval	300, 600, 1,600	P G [1] ..	N	0.60[2, 5]	—	[18] Weather, ice and other reports transmitted daily at 0200 and 1400 (G.M.T.)
Grady, Labrador ..	53° 48' 00" N. 56° 23' 00" W.	VOE	150	Marconi Co. of Canada	600	—[12]	0800 to 2000[13, 14]	0.60	—	[19] To ships subscribing to service
Grindstone Island ..	Gulf of St. Lawrence, Magdalen Islands 47° 23' 00" N. 61° 54' 20" W.	VCN	200	Marconi Co. of Canada	300, 600	P G [1] ..	N	0.30	—	
Grosse Isle, Quebec ..	47° 02' 00" N. 70° 40' 05" W.	VCD	100	Marconi Co. of Canada	300, 600	P G [1] ..	N	0.15	—	
Halifax Dockyard ..	Nova Scotia 44° 39' 30" N. 63° 35' 10" W.	VAA	—	Government ..	—	O ..	—	—	—	
Harrington, Quebec	50° 29' 40" N. 59° 27' 45" W.	VCJ	150	Marconi Co. of Canada	300, 600	P G [1] ..	N [6]	0.30	—	
Heath Point ..	—	VCI	—	—	—	—	—	—	—	
High River	Alberta	VAW	—	Government	900	—[16]	—	—	—	
Holton, Labrador ..	54° 35' 00" N. 57° 15' 00" W.	VOG	150	Marconi Co. of Canada	600	—[12]	0800 to 2000[13, 14]	0.60	—	
Ikeda Head	British Columbia (Moresby Island) 52° 17' 10" N. 131° 07' 34" W.	VAI	250	Government, Naval	300, 600	P G [1] ..	0800 to 2400[7]	0.60[2]	—	
Jericho Beach ..	Vancouver	—	—	Government ..	900	—[16]	—	—	—	
Kingston, Ontario ..	44° 14' 05" N. 76° 27' 30" W.	VBH	350	Marconi Co. of Canada	300, 600, 1,600	P G [1] ..	N	0.15	—	
Le Pas, Manitoba ..	53° 52' 45" N. 101° 21' 30" W.	VBM	600	Government ..	900, 1,800, 2,400	O [9] ..	X	—	—	
Lurcher Lightship ..	Nova Scotia 43° 49' 30" N. 66° 32' 00" W.	VDR	100	Department of Marine	300, 600	O ..	X	—	—	
Midland, Ontario ..	44° 44' 40" N. 79° 51' 45" W.	VBC	350	Marconi Co. of Canada	300, 600, 1,600	P G [1] ..	N	0.15	—	
Mokkovik	55° 13' 00" N. 59° 08' 00" W.	VOI	150	Marconi Co. of Canada	600	—[12]	0800 to 2000[13, 14]	0.60	—	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
CANADA and NEWFOUNDLAND—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Montreal	Quebec 45° 32′ 45″ N. 73° 31′ 45″ W.	VCA	200	Marconi Co. of Canada	300, **600**	P G[1] ..	N[6]	0.15	—	
Newcastle	New Brunswick 47° 00′ 20″ N. 65° 34′ 10″ W.	VAN	—	—	—	P ..	—	—	—	
North Sydney, Nova Scotia	Cape Breton Island 46° 13′ 10″ N. 60° 14′ 50″ W.	VCO	200	Marconi Co. of Canada	300, **600**	P G[1] ..	N	0.30	—	
Pachena	Vancouver Island 48° 43′ 40″ N. 125° 06′ 20″ W.	VAD	300	Government, Naval	300, **600**, 1,600	P G[1] ..	N	0.60[2]	—	
Partridge Island ..	—	VCV	—	—	—	—	—	—	—	
Picton, Nova Scotia	—	VCQ	—	—	—	—	—	—	—	
Point Armour ..	Strait of Belle Isle 51° 27′ 25″ N. 56° 50′ 30″ W.	VCL	150	Marconi Co. of Canada	**600**, 600	P G[12] ..	N	0.30	—	
Point Edward ..	Ontario 43° 00′ 10″ N. 82° 24′ 55″ W.	VBE	350	Marconi Co. of Canada	300, **600**, 1,600	P G[1] ..	N	0.15	—	
Point Grey	British Columbia, near Vancouver 49° 15′ 55″ N. 123° 15′ 20″ W.	VAB	150	Government, Naval	300, **600**, 1,600	P G[1] ..	N	0.60[2,5]	—	
Point Riche.. ..	Strait of Belle Isle 50° 42′ 00″ N. 57° 24′ 30″ W.	VCH	250	Marconi Co. of Canada	300, **600**	P G ..	N[6]	0.30	—	
Port Arthur, Ontario	48° 26′ 30″ N. 89° 13′ 45″ W.	VBA	350	Marconi Co. of Canada	300, **600**, 1,600	P G[1] ..	N	0.15	—	
Port Burwell ..	Ontario 42° 38′ 35″ N. 80° 47′ 15″ W.	VBF	350	Marconi Co. of Canada	300, **600**, 1,600	P G[1] ..	N	0.15	—	
Port Nelson, Manitoba	Hudson Bay 57° 03′ 20″ N. 92° 34′ 30″ W.	VBN	150 600[10]	Government ..	300, **600**, 1,800	P G ..	N	0.60	—	
Quebec	46° 48′ 25″ N. 71° 12′ 25″ W.	VCC	150	Marconi Co. of Canada	300, **600**	P G[1] ..	N	0.15	—	

Sault Ste. Marie, Ontario	[illegible] 84° 17′ 30″ W.	VBB	350	[illegible] Co. of Canada	[illegible]	[illegible] ..	N	0.15	—	
Smokey Tickle ..	54° 26′ 00″ N. 57° 11′ 00″ W.	VOF	150	Marconi Co. of Canada	600	—[13]	0800 to 2000[13] [14]	0.60	—	
St. John, N.B. ..	Near Red Head 45° 15′ 04″ N. 66° 00′ 47″ W	VAR	200	Government ..	600, 800	P G & D F[4]	N	—	—	
St. Johns, Newfoundland	47° 31′ 00″ N. 52° 52′ 00″ W.	BZM	1,000	British Admiralty	600, 2,000 (spark) 4,000, 4,200, 5,000 (arc)	O ..	—	—	—	
Three Rivers, Quebec	46° 20′ 45″ N. 72° 33′ 25″ W.	VCB	150	Marconi Co. of Canada	300, 600	P G[1] ..	N[3]	0.15	—	
Tobermory, Ontario	45° 15′ 55″ N. 81° 39′ 40″ W.	VBD	350	Marconi Co. of Canada	300, 600, 1,600	P G[1] ..	N	0.15	—	
Toronto VBG ..	43° 36′ 50″ N. 79° 23′ 10″ W.	VBG	350	Marconi Co. of Canada	300, 600, 1,600	P G[1] ..	N	0.15	—	
Triangle Island ..	—	VAG	—	—	—	—	—	—	—	
Venison Island ..	55° 46′ 00″ N. 53° 14′ 00″ W.	VOB	100	Marconi Co. of Canada	600	—[13]	0800 to 2000[13] [14]	0.60	—	
CANARY ISLANDS										
Las Palmas	28° 00′ 00″ N. 15° 22′ 10″ W.	EAL	860	Compania Nacional de T.S.H.	300, 600, 2,540	P G ..	N	0.45	4.50	
Teneriffe	28° 28′ 30″ N. 16° 15′ 00″ W.	EAT	860	Compania Nacional de T.S.H.	300, 600, 2,540	P G ..	N	0.45	4.50	[1] Under construction
CAPE VERDE ISLANDS										
St. Vincente Island[1] (Mindello)	16° 54′ 00″ N. 24° 59′ 00″ W.	—	—	—	600, 1,000, 1,200, 1,600, 3,000	—	—	—	—	
St. Thiago Island[1] (Praia)	15° 00′ 00″ N. 23° 40′ 00″ W.	—	—	—	600, 1,000, 1,600	—	—	—	—	
Sal Island[1]	16° 49′ 00″ N. 22° 56′ 00″ W.	—	—	—	300, 600, 1,000	—	—	—	—	
Boa Vista Island[1] ..	16° 05′ 00″ N. 22° 50′ 00″ W.	—	—	—	300, 600, 1,000	—	—	—	—	
CEYLON										
Colombo Radio ..	6° 55′ 07″ N. 79° 52′ 53″ E.	VPB	390	Government ..	300, 600	P G ..	N	0.60	—	
Matara, Ceylon ..	5° 59′ 00″ N. 80° 32′ 00″ E.	BZE	—	—	2,000[1]	O[1] ..	—	—	—	[1] The station sends out a weather bulletin at 1.30 a.m. and 1.30 p.m. (Greenwich mean time) on a wavelength of 2,000, metres. The first portion of the bulletin refers to the Bay of Bengal and is prefixed by the word "Bay"; the second portion refers to the Arabian Sea and is prefixed by the words "Arabian Sea"
CHILE										[2] The long wave is used for inland correspondence
Ancud	41° 52′ 00″ S. 73° 52′ 00″ W.	—	—	Government ..	—	—	Chilian Standard Time[3]	—	—	[3] Four hours later than Greenwich time

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge.		Remarks.
								Per Word.	Minimum Charge.	
	Meridian of Greenwich.							Francs.	Francs.	
CHILE—*contd.*										
Antofagasta	23° 27′ 35″ S. 70° 31′ 30″ W.	CCB	400	Government ..	300, **600**, 1,300 [1]	P G ..	N	0.60	6.00	
Arica	18° 29′ 00″ S. 70° 20′ 35″ W.	CCA	400	Government ..	**600**, 1,300 [1]	P G ..	N	—	—	
Bories	51° 45′ 00″ S. 72° 32′ 00″ W.	CCV	300	—	300, **600**	P R ..	0900 to 1100 1400 to 1600 2100 to 2300	—	—	
Coquimbo	29° 57′ 35″ S. 71° 20′ 00″ W.	CCC	400	Government ..	**600**, 1,300 [1]	P G ..	—	0.60	6.00	
Evanjelistas	—	CCY	—	—	—	—	—	—	—	
Félix, Chile	—	CCZ	—	—	—	—	—	—	—	
Huafo	Huafo Island 43° 33′ 37″ S. 74° 49′ 30″ W.	CCQ	250	Government ..	**600**, 900 [1]	P R ..	0900 to 1100 1400 to 1600 2100 to 2300	0.60	6.00	
Juan Fernandes ..	Juan Fernandez Island 33° 37′ 30″ S. 78° 49′ 50″ W.	CCD	250	Government ..	**600**, 1,600	P G ..	0900 to 1100 1400 to 1600 2100 to 2300	0.60	6.00	
Llanquihue	41° 32′ 00″ S. 72° 55′ 00″ W.	CCO	2,000	Government ..	**2,500**, 5,000	—[3]	—	—	—	
Mocha, Chile (La) ..	—	CCN	200	—	300, **600**	P R ..	—	—	—	
Punta Arenas Apost.	—	CCX	—	—	300, **600**	P R ..	—	—	—	
Punta Arenas Catalina	—	CCW	2000	—	—	—	—	—	—	
Raper	Peninsula of Taytao 46° 49′ 45″ S. 75° 37′ 30″ W.	CCS	250	Government ..	**600**, 1,600	P G ..	0900 to 1100 1400 to 1600 2100 to 2300	0.60	6.00	
Rio Aysen	—	CCR	—	—	300, **600**	P R ..	—	—	—	
Santiago Espejo ..	—	CCI	—	—	—	—	—	—	—	
Santiago Moneda ..	—	CCG	300	—	300, **600**	O ..	—	—	—	
Santiago Univers ..	—	CCH	—	—	—	—	—	—	—	
Talcahno Esc. Torp.	—	CCL	250	—	300, **600**	—	N	—	—	
Talcahno Rocuant ..	—	CCK	700	—	300, **600**	P G ..	N	—	—	
Valparaiso P. Anch.	33° 01′ 06″ S. 71° 38′ 06″ W.	CCE	300	Government, Naval	300, **600**, 1,300 [1]	P G [4] ..	N	0.60	6.00	
CHINA										

[3] The station is open for inland correspondence

[4] The station transmits a weather report at 0400 and a time signal at 1300 (Greenwich time). (For full particulars see International Time and Weather Signals—Chile.)

[5] For reception

[6] For transmission

Kalgan	[illegible] Chihli 40° 45′ 00″ N. 115° 20′ 00″ E.	XQL	650	Government ..	[illegible] 1,[illegible], 1,[illegible], 2,100, 3,000	O ..	N	—	—
Kashgar [5]	Sinkiang, Eastern Turkestan	—	—	Government ..	—	—	—	—	—
Lan-Chau Fu (Urga)	Kansu	—	—	Government ..	—	—	—	—	—
Peking NPP [7] ..	39° 54′ 50″ N. 116° 22′ 00″ E.	NPP	150	U.S. Navy ..	300, [illegible]	O ..	N	— [6]	— [6]
Peking XPK ..	39° 54′ 00″ N. 116° 27′ 00″ E.	XPK	650	Government ..	600, 1,200, 1,[illegible], 2,100	O ..	N	—	—
Quang-Tcheou-Wan	21° 03′ 34″ N. 110° 27′ 45″ E.	FWA	500	French Government ..	300, [illegible], 1,800	P G ..	0700 to 1100 [10] 1400 to 1700	0.25	2.00
Shanghai	31° 15′ 00″ N. 121° 29′ 00″ E.	XSH	200	Government ..	600	P G [1] ..	0800 to 2200 [8]	0.50 [9]	—
Shanghai-Zikawei ..	31° 11′ 32″ N. 121° 25′ 48″ E.	FFZ	500	Soc. Française Radio-électrique (of Paris) ..	[illegible], 900, 1,800	P G [9] ..	N	0.50	—
Sianfu [5]	Shensi	—	—	Government ..	—	—	—	—	—
Tientsin	—	WYX	—	U.S. Army ..	—	—	—	—	—
Tsungming Kiang-su	121° 20′ 00″ E. 31° 30′ 00″ N.	XSU	—	—	—	—	— [11]	—	—
Urga (see Lan-Chau-Fu)									
Urumchi [5]	Sinkiang	—	—	Government ..	—	—	—	—	—
Woosung, Kiangsu ..	31° 21′ 00″ N. 121° 25′ 00″ E.	XSG	650	Government ..	600, 1,200, 1,[illegible], 2,100	P G [1] ..	N	0.50 [9]	—
Wuchang	Hupeh 30° 30′ 00″ N. 114° 23′ 00″ E.	XOC	650	Government ..	600, 1,200, 1,[illegible], 2,100, 3,000	O ..	0800 to 2200 [8]	—	—
COCHIN CHINA (See **FRENCH-INDO-CHINA**)									
COCOS-KEELING ISLANDS									
Cocos	Indian Ocean 12° 05′ 24″ S. 96° 53′ 20″ E.	VPK	150	Eastern Extension Australasia and China Telegraph Co.	300, [illegible]	P G ..	N	0.60	—
COLOMBIA									
Baranquilla [1] ..	10° 56′ 00″ N. 74° 46′ 00″ W.	—	—	Government ..	—	—	—	—	—

[illegible] China (8 hours in advance of Greenwich time)

[3] In the case of messages originating at or intended for Canton or Shameen, the local land line charge is included in the coast tax

[4] In the case of messages originating at or intended for Foochow the local land line charge is included in the coast tax

[5] Under construction

[6] No charge for relaying messages

[7] Operated by the United States Marine Corps

[8] In the case of messages originating at or intended for Shanghai or Woosung (Kiangsu), the local land line charge is included in the coast tax

[9] The station transmits a time signal (see International Time and Weather Signals—China)

[10] Seventh time belt east of the Greenwich belt

[11] The station only communicates with fixed stations

[1] Under construction

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
COLOMBIA—*contd.*										
Bogota [1]	4° 35′ 00″ N. 74° 12′ 00″ W.	—	—	Government ..	—	—	—	—	—	[1] Approximately [2] On 1,200 meter wave
Cali [1]	3° 25′ 00″ N. 76° 45′ 00″ W.	—	—	Government ..	—	—	—	—	—	
Cartagena, Colombia	10° 40′ 00″ N. 75° 30′ 00″ W.	CTG	600	Ges. für Drahtlose Tel.	**600**, **1,500**, 2,000, 2,500, 3,000	P G ..	0600 to 2400	0.50	—	
Cucuta [1]	7° 28′ 00″ N. 72° 42′ 00″ W.	—	—	Government ..	—	—	—	—	—	
Isla de San Andres ..	Caribbean Sea 12° 35′ 10″ N.[2] 81° 41′ 30″ W.	—	—	Government ..	**600**, 1,200	P G ..	75th meridian 0900[2] to 1400[2], 1730[2]	—	—	
Medellin [1]	6° 02′ 00″ N. 75° 50′ 00″ W.	—	—	Government ..	—	—	—	—	—	
Puerto Colombia [1] ..	11° 02′ 00″ N. 75° 00′ 00″ W.	HJB	450	Government ..	**600**, 1,200	P G ..	N	0.50	—	
Santa Marta ..	—	UCJ	—	United Fruit Co.	—	P ..	—	0.60	—	
COMORO ISLANDS							Third time belt E. of the Greenwich belt.			[1] The station also communicates by radiotelegraphy with Majunga [2] Messages giving warning of cyclones are transmitted by this station. (See International Time and Weather Signals)
Dzaoudzi	Mayotta Island 12° 46′ 55″ S. 45° 16′ 29″ E.	FDO	430	French Government	300, **600**	P G [1] [2]	0700 to 1100 1330 to 1700 1900 to 2100	0.50	—	
Mutsamudu	Johanna 12° 09′ 26″ S. 44° 24′ 27″ E.	FLU	100	French Government	600	P G ..	0700 to 1100 1330 to 1700	0.50	—	
COOK (or Hervey) ISLANDS										
Rarotonga	21° 12′ 00″ S. 159° 48′ 30″ W.	VMR	Day 500[1] Night 850[2]	Government ..	300, **600**, 1,700	P G ..	1800 to 0200 [3]	0.60	—	[1] With the wavelength of 600 metres [2] With the wavelength of 1,700 metres [3] Mean time of New [illegible]

COSTA RICA										
Limon	—	X	—	United Fruit Co.	—	P G ..	—	0.60	—	
CUBA										
Baracoa	Province of Santiago de Cuba 20° 21′ 46″ N. 74° 29′ 13″ W.	PWE	300	Government ..	300, 750	P G ..	—	—	—	[1] The working of the station is temporarily suspended [2] Operated by the United States Navy
Camaguey [1] ..	—	C	—	Government ..	—	P G ..	—	0.40	—	
Cayo Cristo	—	CO	—	Government ..	—	P G ..	—	0.40	—	
Chaparra	Province of Santiago de Cuba 21° 12′ 30″ N. 76° 27′ 40″ W.	PWD	300	Government ..	300, 750	P G ..	—	—	—	
Guantanamo Bay [2]	South Coast of Cuba 19° 54′ 54″ N. 75° 09′ 27″ W.	NAW	250	U.S. Navy ..	300, 600	P G ..	N	0.30	—	
La Fé	Province of Pinar del Rio 22° 02′ 00″ N. 82° 18′ 00″ W.	PWG	500	—	300, 3,800	P G ..	—	—	—	
Maniti	—	NMB	—	U.S. Navy ..	300, 600	P G ..	N	0.30	—	
Morro	Havana 23° 09′ 26″ N. 82° 21′ 29″ W.	PWA	1,000	Government ..	700, 2,800	P G ..	—	—	—	
Nueva Gerona ..	Isla de Pinos 21° 52′ 30″ N. 82° 42′ 00″ W.	PWB	400	Government ..	300, 600	P G ..	—	—	—	
Pinar del Rio ..	Province of Pinar del Rio 22° 25′ 45″ N. 83° 38″ 20″ W.	P WF	300	Government ..	300, 750	P G ..	—	0.40	—	
Santa Clara	Province of S. Clara 22° 24′ 00″ N. 79° 59′ 30″ W.	PWC	300	Government ..	300, 750	P G ..	—	—	—	
Santiago de Cuba ..	—	SN	—	Government ..	—	P G ..	—	0.40	—	
CURAÇAO										
Aruba	Dutch West Indies 12° 31′ 05″ N. 70° 02′ 01″ W.	PJA	108	Government ..	600	—[1]	Local time, 0900 to 1200 1400 to 1700 Sundays and holidays 1145 to 1215	0.60	—	[1] The station exchanges public correspondence with Curaçao [2] The station also exchanges correspondence with Aruba and Bonaire

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
CURAÇAO—*contd.*										
Bonaire, Ile	Dutch West Indies 12° 09′ 20″ N. 68° 16′ 15″ W.	PJB	108	Government ..	600	—[1]	Local time, 0900 to 1200 1400 to 1700 Sundays and holidays: 1145 to 1215	0.60	—	
Curaçao	Dutch West Indies 12° 06′ 20″ N. 68° 56′ 55″ W.	PJC	400	Government ..	300, **600**, 1,800	P G[1]	N	0.60	—	
CYPRUS										
Famagusta	35° 08′ 00″ N. 33° 59′ 00″ E.	BXF	—	—		O ..	—	—	—	
CYRENAICA										
Bengasi Radio ..	32° 06′ 14″ N. 20° 03′ 15″ E.	ICJ	300[1] 160-300[2]	—	2,400[1] 300, **600**[2]	P G ..	X[3]	0.60	—	[1] Poulsen arc; C.W. [2] Spark 600 and 400. [3] The station keeps watch on the 2,400 metres wavelength (C.W.) for 15 minutes at the following times:—0345, 0745, 1145, 1545, 1945, 2345
Derna Radio ..	32° 44′ 54″ N. 22° 39′ 46″ E.	ICO	270	—	300, **600**	P G ..	N	0.60	—	
Tobruch Radio ..	32° 03′ 30″ N. 24° 00′ 00″ E.	ICU	270	—	300, **600**	P G ..	N	0.60	—	
CZECHO-SLOVAKIA										
Prague	—	PRG	—	—	4,100 (C.W.)	—	0920, 1545, 2030 (G.M.T.)	—	—	[1] At the request of ships and on payment of the charges, transmission of meteorological reports (not more than twenty words), giving the following information:— (*a*) a general summary of the atmospheric conditions of the morning of the day of transmission of the report; (*b*) a forecast of the weather-strength and
DANZIG (Free Town of)							Central European Time			
Danzig	Baltic Sea Coast 54° 20′ 56″ N. 18° 39′ 08″ E.	KAZ	80	—	600	P G[1]	0700 to 2400[2]	0.37[3]	3.75	

										... Baltic coast, for the day (12 p.m.—12 p.m.) following the transmission of the forecast; (c) a storm warning, if required. Charge per per word: 37.5 centimes, without minimum. [2] The station is also opened on receipt of telegrams containing storm warnings, and remains open until the danger is past
DENMARK							Central European Time [1]			
Anh-It-Knob [2] ..	56° 45′ 58″ N. 11° 51′ 51″ E.	OUR	100	—	300, 600	— [5]	X	—	—	
Blaavand Radio ..	North Sea Coast 55° 33′ 29″ N. 8° 05′ 11″ E.	OXB	Day 200 Night 500	Government ..	300, 450, 600, 1,800	P G ..	N	0.40	4.00	
Copenhagen Radio ..	55° 40′ 49″ N. 12° 36′ 32″ E.	OXA	200	Government ..	300, 600	P G ..	N	0.40	4.00	
Drogden [2] [3]	The Sound 55° 33′ 03″ N. 12° 42′ 57″ E.	OUW	15	Government ..	300, 600	— [5]	X	—	—	
Gilleleje-Flak N [2] ..	56° 09′ 48″ N. 12° 18′ 00″ E.	OUE	30	Government ..	300, 600	P R [3] ..	X	—	—	
Gjedser [3] [4] ..	Falster Island 54° 34′ 25″ N. 11° 55′ 48″ E.	OXC	135	State Railways of Denmark ..	300, 450, 600, 800, 1,000	O [4] ..	0600 to 2000	—	—	
Gjedser Havn [2] [3] ..	54° 32′ 24″ N. 11° 56′ 20″ E.	OXD	25	State Railways of Denmark	250	— [5]	In general, N	—	—	
Gjedser Rev. [2] ..	Baltic Sea 54° 27′ 12″ N. 12° 11′ 00″ E.	OUU	5	Government ..	300	P R [3] ..	X	—	—	
Graadyb [2] [3]	North Sea 55° 20′ 02″ N. 8° 04′ 41″ E.	OUX	30	Government ..	300, 600	— [5]	X	—	—	
Horns Rev [2] [3] ..	North Sea 55° 34′ 06″ N. 7° 19′ 30″ E.	OUZ	30	Government ..	300, 600	— [5]	X	—	—	
Kjobenhavn Radio ..	55° 40′ 49″ N. 12° 36′ 32″ E.	OXA	Day 200 Night 500	—	300, 600, 1,800	P G ..	N	0.40	4.00	
Laeso-Rende [2] ..	57° 12′ 48″ N. 10° 41′ 38″ E.	OUK	100	Government ..	300, 600	— [5]	X	—	—	
Laeso-Trindel [2] ..	57° 26′ 30″ N. 11° 16′ 45″ E.	OUT	100	Government ..	300, 600	— [5]	X	—	—	
Lyngby Radio ..	Zealand 12° 28′ 34″ E. 55° 45′ 57″ N.	OXE	—	State Telegraphs	2,500, 4,200, 5,000 (C.W.)	— [5]	N	—	—	

[1] One hour in advance of Greenwich time

[2] Lightship. The position shown is that of the anchor

[3] Communicates with ships in case of distress only

[4] Official correspondence with the Danish ferry boats of the Gjedser-Warnemünde line, concerning railway traffic

[5] The station only corresponds with fixed stations

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
DENMARK—*contd.*	Meridian of Greenwich							Francs.	Francs.	
Schultz-Grund[3] ..	56° 08′ 54″ N. 11° 11′ 10″ E.	OUC	100	Government ..	300, **600**	P R ..	X	—	—	
Skagens Rev.[3] ..	North Sea 57° 46′ 00″ N. 10° 43′ 20″ E.	OUB	100	Government ..	300, **600**	P R[2] ..	—	—	—	
Vyl[2,3]	North Sea 55° 23′ 38″ N. 7° 44′ 13″ E.	OUY	30	Government ..	300, **600**	—[2]	X	—	—	
DODECANESE										
Rodi	—	ICW	—	Italian Army ..	—	—	—	—	—	
Stampalia	—	IDA	—	Italian Army ..	—	—	X	—	—	
DUTCH EAST INDIES										
Amboina Radio ..	Amboina Island 3° 47′ 30″ S. 128° 05′ 00″ E.	PKE	420	Government ..	**600**, 1,600, 2,300	P G ..	Java Mean Time.[1] Weekdays: 0700 to 0800 1330 to 1900 Sundays: 1330 to 1900	0.80	8.00	
Balikpapan Radio ..	Borneo 1° 16′ 10″ S. 116° 50′ 45″ E.	PKF	150	Batavia Petroleum Co.	**600**, 1,800,	P G ..	0900 to 1000 1430 to 1530 1600 to 1630	0.80	8.00	
Bandoeng Radio ..	Java 107° 36′ 00″ E. 6° 56′ 00″ S.	PKX	10800	—	6,000, **9,000**, 12,000[4], 15,000	—[5]	1330 to 1630 (G.M.T.)	—	—	
Dilli[3]	Timor 8° 33′ 00″ S. 125° 35′ 00″ E.	—	—	—	600, 1,200, 1,600, 2,400	—	—	—	—	
Koepang Radio ..	Timor 10° 09′ 30″ S. 123° 35′ 30″ E.	PKD	420	Government ..	**600**, 1,600, 2,300	P G ..	Weekdays: 0700 to 0800 1330 to 1900 Sundays: 1330 to 1900	0.80	8.00	
Manggarai	6° 12′ 10″ S. 106° 51′ 55″ E.	—	—	—	—	—	—	—	—	
Neira Radio ..	Banda Islands 4° 31′ 53″ S. 129° 53′ 32″ E.	PKJ	250	—	1,400 (arc)	P R ..	—	—	—	

Remarks:

[1] Mean time of the Island of Java, 109° 48′ 37.05″ E. of Greenwich

[2] The station communicates only with the steamers of the following companies: Java-China-Japan Line; Java-Pacific Line, Anglo-Saxon Petroleum Co., Koninklijke Steam Packet Co., Rotterdam-Lloyd, Netherland Steamship Co., Dutch Indies Tank Steamer Co., La Coroña Petroleum Co., Zeelandia Sealighter Co., Batavia Petroleum Co.

[3] Under construction

[4] Calls on a wavelength of 12,000

[5] Provisional station

Sabang Radio ..	Sumatra, Weh Island 5° 53′ 50″ N. 95° 20′ 18″ E.	PKA	Day 400 Night 800	Government ..	600	P G ..	N	c.80	8.00	
Siteobondo Radio	Java 7° 41′ 20″ S. 114° 05′ 30″ E.	PKC	420	Government ..	600, 1,600 2,300	P G ..	Weekdays: 0700 to 0800 1330 to 1900 Sundays: 1330 to 1900	0.80	8.00	
Soerabaya	Java 7° 11′ 55″ S. 112° 44′ 21″ E.	PKH	—	Government Marine Dept. ..	—	O ..	—	—	—	
Tarakan Radio ..	Island of Tarakan 3° 18′ 25″ N. 117° 36′ 15″ E.	PKG	150	Batavia Petroleum Co.	600, 1,800	P G ..	0910 to 1000 1430 to 1530 1600 to 1630	0.80	8.00	
Weltevreden Radio	Near Batavia 6° 12′ 10″ S. 106° 51′ 55″ E.	PKB	270	Government Marine Dept.	600	P G, O	0600 to 2300 Sundays and holidays: 0900 to 1200 1500 to 1700	0.80	8.00	
ECUADOR										[1] Under construction [2] Inland service of Ecuador only
Esmeraldas	0° 12′ 00″ N. 79° 42′ 00″ W.	HCE	500	Government ..	600, 1,700 (spark)	P G ..	0600 to 1000 1300 to 1600 1800 to 2200	0.60	6.00	
Guayaquil	—	GPH	—	Captain of the port	—	P ..	—	—	—	
Guayaquil	2° 12′ 00″ S. 79° 50′ 00″ W.	HCG	900	Government ..	600, 2,500, 3,200 (spark)	P G ..	N	0.60	6.00	
Quito	0° 13′ 00″ S. 78° 32′ 00″ W.	—	900	Government ..	600, 2,500, 3,200	—[2]	N	—	—	
Santa Elena Point[1] ..	—	—	—	—	—	—	—	—	—	
EGYPT							Eastern European Time[1]			[1] Eastern European time, 2 hours in advance of Greenwich time [2] Under construction
Abu Zabal, Cairo[2] ..	Near Cairo 30° 02′ 00″ N. 31° 16′ 00″ E.	SUC	—	Post Office ..	4,500, 5,400 (spark) 5,800, 7,400 (cw)	—	—	—	—	
Alexandria (Ras-el-Tin)	31° 16′ 00″ N. 30° 00′ 00″ E.	SUH	450	Egyptian Government	300, 600, 1,000, 1,200 to 2,000	P G ..	N	0.60	—	
Port Said Radio ..	31° 14′ 00″ N. 32° 19′ 00″ E.	SUB	400	Egyptian Government	300, 600	P G ..	N	0.60	—	
ERITREA										[1] Communicates only with fixed stations [2] Open for public correspondence direct with Rome [3] Communicates also with Mogadiscio ISG
Asmara	15° 20′ 00″ N. 38° 30′ 00″ E.	ICW	—	Italian Government	—	—	—	—	—	
Assab Radio.. ..	12° 59′ 40″ N. 42° 44′ 00″ E.	ICY	160	Italian Government	300, 600 2,300 3,900	P G ..	2400 to 0200 1200 to 1400 1600 to 1800 2000 to 2200	0.60	—	
Massaua Radio IRG	Red Sea 15° 36′ 30″ N. 39° 28′ 59″ E.	IRG	350	Italian Government	600, 1,200	P G ..	2400 to 0500 1200 to 2400	0.60	—	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
ERITREA—*contd.*										
Massaua Radio ICX	Red Sea 15° 36′ 30″ N. 39° 28′ 59″ E.	ICX	1,600	Italian Government	4,000	P G [1,2]	X	0.60	—	
Thio [1]	Red Sea 14° 41′ 45″ N. 40° 57′ 35″ E.	IRT	160	Italian Government	600	—	—	—	—	
ESTHONIA										
Hapsal	Esthonia 59° 00′ 00″ N. 23° 48′ 00″ E.	REC	—	—	—	O ..	—	—	—	
Reval..	59° 20′ 00″ N. 24° 15′ 00″ E.	ROR	170	—	300, 420, **600**	P G ..	0600 to 2200	0.60	—	
FALKLAND ISLANDS										[1] Local time, 3 hours 55 minutes later than Greenwich time
Falkland Islands ..	52° 30′ 00″ S. 61° 20′ 00″ W.	BZN	650	British Admiralty	300, **600**	P R ..	Local Time [1] 0900 to 1200 2100 to 2400	0.60	—	[2] In the case of messages originating at or intended for Falkland Islands the local land line charge is included in the coast tax
Fox Bay	51° 59′ 00″ S. 60° 02′ 00″ W.	VQZ	80-100	Colonial Government	600	—[3]	—	—	—	[3] Communicates only with fixed stations
FANNING ISLAND										
Fanning	3° 51′ 23″ N. 159° 21′ 50″ W.	VQN	Day 300 Night 500	F. R. Pelly ..	300, **600**	P R [1] ..	—	0.60	—	[1] The station also exchanges official and public correspondence with Washington VQO
FAROE ISLANDS										
Thorshavn	Island of Stromo 62° 00′ 52″ N. 6° 46′ 00″ W.	OXJ	100	Great Northern Telegraph Co.	300, 500, **600**	P G [1] ..	—[3]	0.40	4.00	[1] The station also communicates with Tvaeraa
Tvaeraa	Island of Sudero 61° 33′ 12″ N. 6° 48′ 00″ E.	OXK	—	—	300, 500, **600**	—[2]	—	—	—	[2] The station only communicates with Thorshavn [3] The station is open weekdays :0800 to 2100 (2130 from June 1 to Aug. 31). Sundays and

									holidays: 1100 to 1300 and 1700 to 2000. However, with the exception of the first ten minutes of each of these hours it communicates with ships only if not occupied in communication with Tvaeraa
FERNANDO PO									
Santa Isabel de Fernando Po	3° 46′ 00″ N. 8° 48′ 40″ E.	EAY	130	Government ..	300, 600, 1,800	P G ..	Local Time. 0600 to 0900 1900 to 2200	0.55 [1]	5.50 [1]	[1] In the case of messages destined to the island of Fernando Po, the charge for delivery to destination is included in the coast charge; and, moreover, the minimum charge is not applicable to these messages destined to the island
FIJI ISLANDS							Fiji Islands Time.[1]			[1] Twelve hours in advance of Greenwich time [2] The station exchanges meteorological telegrams with ships in stormy weather [3] From Monday to Friday, 0900 to 1300, 1400 to 1500, or until completion of work, and at 1900 until completion of work; Saturday, as above, but first watch only. Sundays and holidays, 0800 to 0830, and at 1900 till completion of work [4] The station only works with fixed stations
Labasa	16° 26′ 05″ S. 179° 24′ 33″ E.	VPE	300	Government ..	300, 600	P G [2] ..	—[3]	0.60	—	
Savu Savu	Vanua Levu 16° 46′ 30″ S. 179° 21′ 30″ E.	VQL	120	Government ..	600	—[4]	—	—	—	
Suva	Viti Levu 18° 08′ 43″ S. 178° 27′ 35″ E.	VPD	300	Government ..	300, 600	P G [2] ..	—[3]	0.60	—	
Taveuni	16° 47′ 46″ S. 179° 59′ 44″ W.	VPF	200	Government ..	300, 600	P G [2] ..	—[3]	0.60	—	
FINLAND										[1] Under construction [2] Time of Helsingfors, 1 hour 40 minutes in advance of Greenwich time [3] Information regarding weather is distributed from the station at 1010 and 1630 on a wavelength of 2,000 metres [4] Other wavelengths are fitted for official use only
Abo	22° 14′ 15″ E. 60° 25′ 38″ N.	OJE	200	—	1,200	O ..	0600 to 2430 [2]	—	—	
Hango	22° 56′ 40″ E. 59° 50′ 18″ N.	OJD	200	—	300, 600	P G ..	N	0.30	1.50	
Helsingfors	25° 03′ 07″ E. 60° 08′ 24″ N.	OJA	500	—	1,500, 2,000 [3] [4]	O [3] ..	N	—	—	
Kotka	26° 57′ 04″ E. 60° 27′.16″ N.	OJC	200	—	600, 1,200	O ..	0600 to 2400	—	—	
Waasa	21° 37′ 00″ E. 63° 05′ 10″ N.	OJG	200	—	1,200	O ..	—	—	—	
Wiborg	28° 45′ 00″ E. 60° 42′ 55″ N.	OJB	200	—	300, 600	P G ..	N	0.30	1.50	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
FRANCE	Meridian of Greenwich.							Francs.	Francs.	
Ajaccio-Aspretto ..	Corsica 41° 55′ 31″ N. 8° 45′ 36″ E.	FUI	—	Navy	—	O ..	N	—	—	
Bernières-Gonio [2] ..	49° 20′ 00″ N. 0° 25′ 00″ W.	FEB	—	Navy	450	D F ..	—	—	—	
Bonifacio T.S.F. ..	Strait of Bonifacio 41° 23′ 15″ N. 9° 12′ 00″ E.	FFC	350	Postal, Telegraph and Telephone Administration	300, **600**	P G ..	N	0.40[1]	—	
Bordeaux T.S.F. ..	44° 52′ 21″ N. 0° 37′ 12″ W.	FFX	250	Postal, Telegraph, and Telephone Administration	300, **600**	P G ..	N	0.40	—	
Boulogne-sur-Mer T.S.F. ..	50° 43′ 00″ N. 1° 37′ 00″ E.	FFB	250	Postal, Telegraph, and Telephone Administration	300, **600**	P G ..	N	0.40[3]	—	
Brest-Guipavas [2] ..	48° 27′ 00″ N. 4° 26′ 30″ W.	FHA	—	Navy	450, **600**	D F ..	—	—	—	
Calais..	50° 58′ 00″ N. 1° 51′ 00° E.	FUL	—	Navy	—	O ..	—	—	—	
Chemoulin	47° 14′ 00″ N. 2° 18′ 00″ W.	FUH	—	Navy	450, **600**	—	—	—	—	
Cherbourg-Gonio ..	49° 36′ 32″ N. 1° 36′ 00″ W.	FUC	—	Navy	450	D F ..	N	—	—	
Cherbourg-Rouges-Terres [5]	49° 36′ 32″ N. 1° 36′ 00″ W.	FUC	300	Navy	300, **600**	P G ..	N	0.40[3]	—	
Croix d'Hins [10] ..	Near Bordeaux	—	—	—	—	—	—	—	—	
Dieppe	49° 55′ 30″ N. 1° 04′ 30″ E.	FFI	150	State Railway Administration	400	P R [7] ..	0900 to 1700 2100 to 0500	0.40	—	
Dunkerque Castelnau	51° 00′ 30″ N. 2° 23′ 15″ E.	FUD	800	Navy	**600**	P R ..	0200 to 0400 0800 to 1000 1600 to 1800 2000 to 2200	0.40	—	
Eiffel Tower, Paris..	48° 51′ 30″ N. 2° 18′ 00″ E.	FL	—	Army	2,500	—[8]	—	—	—	
Gris-Nez-Gonio ..	50° 52′ 18″ N. 1° 35′ 18″ E.	FEN	—	Navy	450	D F ..	N	—	—	
Guipavas-Gonio ..	48° 27′ 00″ N. 4° 26′ 00″ W.	FEG	—	Navy	450	D F ..	N	—	—	
Havre T.S.F. (Le) [5]..	49° 31′ 30″ N. 0° 07′ 00″ E.	FFH	250	Postal, Telegraph, and Telephone Administration	300, **600**	P G ..	N	0.40[3]	—	

[1] The coast charge is reduced to fr. 0.15 per word for ships whose regular service is between France on the one hand and Corsica, Algeria, and Tunis on the other

[2] Direction finding station

[3] The coast charge is reduced to fr. 0.15 per word for correspondence with ships whose home ports are on the coast of the English Channel and the Straits of Dover, and which are engaged in a regular service between France and England.

[4] Direction finding station, all transmission is made by Mengam FUE

[5] This station is also open for direction finding service

[6] Direction finding station, all transmission is made by Ouessant T.S.F. FFU

[7] Special correspondence in connection with the marine business of the ships employed on the service between Dieppe Newhaven

[8] Transmits daily a time signal and meteorological message. (See International Time and [illegible]

Lorient-Gonio	47° 44′ 00″ N. 3° 21′ 00″ W.	FUN		—	450	D F ..	N	—	—
Lorient-Pen-Mané [9] ..	47° 44′ 00″ N. 3° 21′ 00″ W.	FUN	300	Navy	300	P R ..	N	0.40	—
Lyons	45° 41′ 00″ N. 4° 47′ 00″ E.	YN	—	—	15,000 (c.w.)	— [9]	—	—	—
Marseilles-Gonio [12]	43° 17′ 58″ N. 5° 21′ 16″ E.	FFM	—	Navy	450	D F ..	N	—	—
Marseilles T.S.F. ..	43° 19′ 00″ N. 5° 21′ 00″ E.	FFM	250	Postal, Telegraph, and Telephone Administration	300, 600	P G ..	N	0.40 [1]	—
Mengam	near Brest 48° 20′ 52″ N. 4° 35′ 20″ W.	FUE	—	Navy	—	O ..	N	—	—
Mitre-Gonio (La) ..	near Toulon 5° 55′ 37″ E. 43° 06′ 11.4″ N.	FEM	—	Navy	450	D F [16] ..	N	—	—
Moulin du Seigneur-Gonio	near Brest 4° 33′ 14″ W. 48° 19′ 36″ N.	FEI	—	Navy	450	D F [16] ..	N	—	—
Nantes	—	UA	—	—	11,000	—	—	—	—
Nice T.S.F.	43° 39′ 00″ N. 7° 10′ 00″ E.	FFN	250	Postal, Telegraph, and Telephone Administration	300, 600	P G ..	N	0.40 [1]	—
Ouessant-Gonio [13] ..	48° 26′ 27″ N. 5° 05′ 33″ W.	FFU	—	Navy	450	D F ..	N	—	—
Ouessant T.S.F. ..	Ushant Island 48° 27′ 05″ N. 5° 05′ 00″ W.	FFU	400	Postal, Telegraph, and Telephone Administration	300, 600	P G ..	N	0.40	—
Ouessant-Pen ar Roch [6]	48° 26′ 27″ N. 5° 05′ 33″ W.	FEO	—	Navy	450, 600	D F [6]	—	—	—
Paris [15]	—	ZA	—	Army	1,400	—	0745, 0800, 1150	—	—
Penmarch-Gonio ..	Finistère 4° 21′ 01″ W. 47° 48′ 30″ N.	FEP	—	Navy	450	D F [16] ..	N	—	—
Pointe du Raz-Gonio [2]	48° 02′ 23″ N. 4° 43′ 54″ W.	FER	—	Navy	450	D F ..	N	—	—
Porquerolles ..	Hyeres Islands 42° 59′ 00″ N. 6° 12′ 00″ E.	FUQ	—	Navy	—	O ..	N	—	—
Rochefort-sur-Mer ..	45° 55′ 30″ N. 0° 57′ 00″ W.	FUR	—	Navy	—	O ..	N	—	—
Sainte Assise (Paris Radio Centre)	—	UFQ	—	—	2,300 (c.w.)	—	—	—	—
Soubise-Gonio [2] ..	45° 56′ 00″ N. 0° 58′ 40″ W.	FES	—	Navy	450	D F ..	N	—	—
S. Marie de la Mer T.S.F.	Gulf of Lyons 43° 27′ 00″ N. 4° 26′ 00″ E.	FFS	450	Postal, Telegraph, and Telephone Administration	300, 600	P G ..	N	0.40 [1]	—
S. Nazarei Ville-es-Martin-Gonio	47° 15′ 24″ N 2° 13′ 49″ W	FEZ	—	Navy	450	D F ..	N	—	—
Toulon Croix des Signaux	43° 04′ 45″ N. 5° 56′ 05″ E.	FUX	—	Navy	—	O ..	N	—	—

[9] Transmits daily a time signal. (See International Time and Weather Signals)

[10] Under construction

[11] The station works with ships entering or leaving the port of Bayonne

[12] Works in connection with Marseilles T.S.F.

[13] Works in connection with Ouessant T.S.F.

[14] Works with Toulon Croix des Signaux

[15] Continuous wave and telephony station

[16] A charge of fr. 6 will be made for each bearing. The French State accepts no responsibility on account of radio compass work

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
FRANCE—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Toulon-Mourillon ..	43° 07′ 00″ N. 5° 55′ 00″ E.	FUT	—	Navy	450	O ..	N	—	—	
Tréguier St. Gonery-Gonio[1]	48° 50′ 08″ N. 3° 13′ 56″ W.	FET	—	Navy	450, **[illegible]**	D F ..	N	—	—	
FRENCH EQUATORIAL AFRICA							Local Time.			
Bangui[3]	—	—	—	—	—	—	—	—	—	[1] One hour in advance of Greenwich time
Brazzaville[3] ..	4° 28′ 00″ S. 15° 13′ 00″ E.	—	—	—	—	—	—	—	—	[2] Continuous service during the voyages of the regular steamers
Duala	4° 02′ 41″ N. 9° 40′ 50″ E.	FKF	—	—	—	O ..	—	—	—	[3] Under construction
Loango	Congo, Pointe Noire 4° 46′ 49″ S. 11° 43′ 02″ E.	FGO	Day 275 Night 550	Government ..	300, **[illegible]**, 1,800	P G ..	0800 to 1030[2] 1400 to 1630[2]	0.30	3.00	
FRENCH GUIANA										
Cayenne	52° 19′ 30″ W. 4° 56′ 30″ N.	HZA	300	—	**[illegible]**, 800, 1,000	P G[2] ..	0800 to 1000[1] 1400 to 1600 local time	0.40	—	[1] The station is open from 7 a.m. to 8 p.m. and during the crossing of the regular packets [2] The station also corresponds with Martinique
FRENCH INDO-CHINA										
Cac-Ba	20° 44′ 00″ N. 107° 02′ 05″ E.	FCB	80	Government ..	300, **[illegible]**	D F ..	0700 to 1100 1400 to 1700	0.50	5.00	[1] Under construction
Fort-Bayard	21° 13′ 00″ N. 110° 23′ 00″ E.	FWA	250	Government ..	1,800, 2,400	P G ..	0700 to 1100 1400 to 1700	0.50 0.50	5.00 5.00	[2] Meteorological telegrams are transmitted at 0930
Ha-Chiang[1]	22° 53′ 00″ N. 104° 57′ 00″ E.	—	—	—	—	—	—	—	—	[3] Seventh time belt east of the Greenwich belt
Hanoi	21° 03′ 49″ N. 105° 54′ 18″ E.	FAO	1,000	Government ..	300, **[illegible]**, 1,800, 2,400, 3,000	P G[2] ..	0700 to 1100 1400 to 1700	0.50	5.00	[4] Meteorological Telegrams are transmitted at 1100 and 2100
Kien-An	Near H[illegible]	FKA	150	Government ..	**[illegible]**, 1,800	P G ..	0700 to 1100 [illegible]	0.50	5.00	

Langson [1]	21° [illegible] N. 106° 40′ 00″ E.	—	—	—	—	—	—	—	—
Lao-Kai [1]	22° 35′ 00″ N. 104° 00′ 00″ E.	—	—	—	—	—	—	—	—
Luang-Prabang [1] ..	19° 50′ 00″ N. 102° 07′ 00″ E.	—	—	—	—	—	—	—	—
Moncay [1]	21° 31′ 00″ N. 107° 58′ 00″ E.	FMI	150	Government ..	600, 1 800	P G ..	0700 to 1100 1400 to 1700	0.50	5.00
My-Tho	10° 21′ 45″ N. 106° 21′ 45″ E.	FCA	250	Government ..	600, 2,000	P G[4] ..	N	0.50	5.00
Phu-Quoc	10° 18′ 00″ N. 103° 58′ 00″ E.	FPK	200	Government ..	600, 2,000	P G ..	0700 to 1100 1400 to 1700	0.50	5.00
Poulo-Condore ..	8° 40′ 00″ N. 106° 41′ 00″ E.	FPR	100	Government ..	600, 2,000	P G ..	0700 to 1100 1400 to 1700	0.50	5.00
Saigon	10° 46′ 47″ N. 104° 21′ 29″ E.	FCA	200	Government ..	300, 600	P G, O..	0700 to 1100[3] 1400 to 1700	0.25	2.00
Tourane	Tourane Bay, Observatory Islet 16° 04′ 05″ N. 108° 13′ 05″ E.	FLT	250	Government ..	300, 600, 1,800	P G ..	N	0.50	5.00
Vientiane [1]	Laos	—	—	—	—	—	—	—	—
FRENCH OCEANIA									
Makatea	148° 11′ 00″ W. 15° 50′ 00″ S.	FFY	Day 400 Night 600	Compagnie Française des Phosphates de l' Océanie	300, 600	P G[11] ..	8 to 9 a.m. 4 to 5 p.m. 2 to 10 p.m.	0.60	—
Nouméa-Sémaphore, New Caledonia	22° 16′ 20″ S. 166° 26′ 53″ E.	FQN	400	Government ..	300, 600	P G ..	Local Time. 1000 to 1100 1400 to 1500 1700 to 1800 2000 to 2400	0.40[1]	—
Port Vila, New Hebrides	17° 44′ 30″ S. 168° 18′ 30″ E.	HNV	600	Government ..	—	P G ..	—	—	—
Wahina Papeete, Tahiti	17° 30′ 15″ S. 149° 29′ 15″ W.	FOP	Day 600[2] Night 1,500[3]	Government ..	600, 2,000, 2,500[4]	P G[5 6]	Local Time[8] 2400 to 0200 0400 to 0500 1930 to 2400[9] Sundays and holidays: 2400 to 0500 0800 to 0900 1930 to 2400[10]	0.60	—

[1] The charge is reduced to 20 centimes for correspondence with ships engaged on a regular service on the coast of New Caledonia and Dependencies

[2] With 600 m. wave

[3] With 2,000 m. wave

[4] The wavelengths of 2,000 and 2,500 m. are used for messages exchanged with Apia (Samoa Is.) every day from 1930 until completion of traffic

[5] Meteorological reports and navigation notices are transmitted twice daily at 1100 and 2300. (See International Time and Weather Signals)

[6] Connected to the International Telegraph System by wireless through Apia (Samoa Is.) and Awanui Radio, New Zealand

[7] The station also communicates with Tutuila, using 600 m. wave

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
FRENCH OCEANIA —*contd.*										[8] Meridian 150° west of Greenwich [9] The station also listens from 0900 to 0915, 1000 to 1015, 1100 to 1115, 1500 to 1515, 1600 to 1615, 1700 to 1715 [10] The hours are extended during the passage of the regular steamers or in case of necessity [11] The station also communicates with Papeete, Ile Tahiti
FRENCH SOMALILAND										
Djibouti	11° 35' 15" N. 40° 47' 05" E.	FJJ	350	Government	600	P G	0700 to 1100 1400 to 1800 2000 to 2400	0.60	—	
FRENCH WEST AFRICA										[1] Interior station [2] The station is open for public correspondence in the inland service [3] This station connects with the International Telegraph System through Port Etienne and Rufisque [4] The station connects with the inland telegraph system through the Rufisque station [5] The Rufisque station communicates with the interior. It only communicates with ships in the case of the interruption of the Dakar station. It then uses the 600-metre wavelength [6] Under construction
Agades [6]	—	—	—	—	—	—	—	—	—	
Atar [1]	Mauritania	—	—	Government	—	P G [2] [3]	—	—	—	
Bamako [6]	12° 40' 00" N. 7° 50' 00" W.	—	—	—	—	—	—	—	—	
Bilma [6]	—	—	—	—	—	—	—	—	—	
Chinguetti [1]	Mauritania	—	—	Government	—	P G [2] [3]	—	—	—	
Conakry	Guinea 9° 30' 59" N. 13° 42' 46" W.	FCO	600	Government	**600**, 2,000	P G	Sunrise to sunset	0.30	—	
Dakar	Senegal 14° 40' 27" N. 17° 25' 22" W.	FDA	600	Government	**600**	P G [5]	N	0.30	—	
Port-Etienne	Mauritania, Bay of Lévrier 20° 55' 39" N. 17° 03' 01" W.	FPE	400	Government	**600**	P G [4]	Sunrise to sunset	0.30	—	
Rufisque	Senegal 14° 43' 04" N. 17° 16' 23" W.	FRU	500	Government	600, **2,000**	P G [5]	Sunrise to sunset	0.30	—	
Tabou	Ivory Coast 4° 25' 19" N. 7° 22' 27" W.	FTA	400	Government	**600**	P G	Sunrise to sunset	0.30	—	
Timbuctu [6]	16° 38' [illegible] N. [illegible] W.	—	—	—	—	—	—	—	—	

FRIENDLY ISLANDS (See TONGA)										
GAMBIA (West Africa)										
Bathurst	13° 25′ 00″ N. 16° 50′ 00″ W.	BZK	500	British Admiralty	600 [1]-2,000 (spark) 4,000 (arc)	P R ..	N	0.60	—	[1] Other wavelengths are used for official correspondence
GEORGIA										
Tiflis	—	TIF[1]	—	Georgian Government	—	—	—	—	—	[1] Unofficial call sign
GERMANY										[1] Public correspondence restricted to urgent messages relating to navigation
Amrumbank Lightship	North Sea 54° 33′ 12″ N. 7° 53′ 12″ E.	KAF	210	Government ..	300, 450, 600	P R [1] [2] ..	N	0.37.5 [2]	3.75 [2]	[2] For telegrams of which the only wireless transmission takes place between the lightship and the shore, a fixed charge of 1 fr. per telegram only is collected, in addition to the ordinary charges for transmission over the land lines
Berlin	—	DM	—	1,900	—	—	—	—	—	
Berlin (See Königs Wusterhausen)										
Berlin Wolff ..	—	DK	—	—	2,100	—	—	—	—	
Borkum F.R.A. ..	North Sea 6° 40′ 54″ E. 53° 34′ 55″ N.	KBO	—	Navy	—	D F [15] ..	N	—	—	
Borkum F.S. ..	North Sea 6° 40′ 12″ E. 53° 34′ 48″ N.	KBM	—	Government ..	600	P R ..	N	0.37.5	3.75	[3] At the request of ships a meteorological report is transmitted. The charge per word is 37.5 c.
Borkum Riff Lightship	North Sea 53° 45′ 30″ N. 6° 03′ 30″ E.	KBR	60	Government ..	300, 600	P R [12] ..	N	0.37.5 [2]	3.75 [2]	
Bremerhaven Lloydhalle ..	North Sea Coast 8° 33′ 08″ E. 53° 33′ 04″ N.	KBH	80	Deutsche Betriebsgesellschaft für drahtlose Telegraphie ..	300	P R [14] ..	N	0.37.5	3.75	[4] This station only communicates with the ships of the Norddeutscher Lloyd Co.
Bulk F.S.	Kiel Bay 10° 12′ 08″ E. 54° 27′ 26″ N.	KBK	—	Government ..	600	P R ..	N	0.37.5	3.75	[5] Storm warnings directed to the German Baltic coast are transmitted three times on a wavelength of 450 metres as soon as received by the station. They are repeated at 1300 and 2300 (Central European time)
Cassel	—	XU	—	—	1,200	—	—	—	—	
Constance	—	KN	—	—	1,450	—	—	—	—	
Cuxhaven	North Sea Coast 53° 52′ 27″ N. 8° 43′ 42″ E.	KBX	Day 325 Night 650	Government ..	300, 600	P G [5] [6] ..	N	0.37.5	3.75	[6] In the case of interruption of the Norddeich station storm warnings are transmitted by Cuxhaven as soon as received by that station. They are repeated once at 1300 and 2300
Darmstadt	—	DA	—	—	1,724	—	—	—	—	
Dortmund	—	DR	—	—	1,400	—	—	—	—	
Eider Lightship ..	North Sea 54° 16′ 06″ N. 8° 18′ 18″ E.	KAJ	30	Government ..	600, 600	P R [1] [2] ..	N	0.37.5 [2]	3.75 [2]	
Elderlotsengaliote Lightship	North Sea 54° 13′ 48″ N. 8° 35′ 39″ E.	KBL	100	Government ..	300, 600	P R [1] [2] ..	N	0.37.5 [2]	3.75 [2]	[7] The station is prepared to receive calls

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
GERMANY—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Eilvese	—	OUI	—	Government ..	15,000 (c.w.)	—	—	—	—	
Elbe Lightship-Eins	North Sea 54° 00′ 16″ N. 8° 15′ 12″ E.	KBF	60	Government ..	300	P R [12] ..	N	0.37.5 [8]	3.75 [8]	
Fehmarnbelt Lightship	Baltic Sea 54° 35′ 45″ N. 11° 09′ 06″ E.	KBC	Day 105 Night 210	—	**300**, 450, 600	P R [12] ..	N	0.37.5 [8]	3.75 [8]	
Francfort-on-Main ..	—	FM	—	—	1,975	—	—	—	—	
Francfort-on-Main ..	—	WH	—	—	1,200	—	—	—	—	
Francfort-on-Oder ..	—	F 4	—	—	1,200	—	—	—	—	
Friedrichshafen ..	—	FD	—	—	—	—	—	—	—	
Hamburg	—	HG	—	—	2,100	—	—	—	—	
Hanover	—	HW	—	—	2,300	—	—	—	—	
Hanover	—	SF	—	—	1,200	—	—	—	—	
Helgoland	North Sea 7° 53′ 00″ E. 54° 11′ 00″ N.	KAH	100	—	300, **600**	P G ..	0700 (0800) to 2100. Sundays and public holidays 0700 (0800) to 1300	0.37.5	3.75	
Königsberg	—	KO	—	—	2,500	—	—	—	—	
Königs Wusterhausen (Berlin)	—	LP	—	Government ..	5,500	—	—	—	—	
Leipzig	—	LZ	—	—	1,100	—	—	—	—	
List F.R.A.	Sylt 8° 23′ 12″ E. 55° 00′ 12″ N.	KAO	—	Navy	—	D F [14] ..	N	—	—	
List F.S.	Sylt 8° 23′ 00″ E. 55° 00′ 00″ N.	KAL	—	Government ..	600	P R ..	N	0.37.5	3.75	
Madgeburg	—	MA	—	—	1,200	—	—	—	—	
Munich	—	CW	—	—	1,200	—	—	—	—	
Munster Ruhr ..	—	W 1	—	—	1,200	—	—	—	—	
Nauen	52° 39′ 00″ N. 12° 55′ 00″ E.	POZ	—	Government ..	5,500 (spk.) 12,600 (c.w.)	—[8]	—	—	—	
Neuenmunster ..	—	OK	—	—	1,200	—	—	—	—	
Neumünster F.S. ..	Sleswig-Holstein 9° 37′ 40″ E. 54° 05′ 40″ N.	KAR	—	Government ..	—	O ..	N	—	—	

Remarks:

chiefly during the first fifteen minutes of each of its hours of service

[8] The station transmits a time signal. (For full particulars see International Time and Weather Signals)

[9] Official correspondence with Tralleborg and with the ferry boats of the Sassnitz-Tralleborg line. Public correspondence is also exchanged with the latter

[10] The station is prepared to receive calls chiefly during the first fifteen minutes of the second half of each of its hours of service

[11] Public correspondence for urgent navigation messages only

[12] Special maritime notices are transmitted three times when they first come to hand and so long as the necessity exists are repeated three times at noon and midnight daily

[13] The station accepts public correspondence when there is no naval correspondence

[14] The station undertakes only the exchange of correspondence between the "Norddeutscher Lloyd" and their ships,

Norddeich	North Sea Coast 53° 36′ 26″ N. 7° 08′ 32″ E.	KAV	Day 420 Night 830	Government ..	300, 600, 1,800	P G [illegible]	N	0.37.5	3.75	
Nordholz F.R.A. ..	North Sea Coast 8° 38′ 30″ E. 53° 47′ 06″ N.	KBQ	—	Navy	—	D F [15] ..	N	—	—	
Nordholz F.S. ..	North Sea Coast	KBN	—	Government ..	600	P R ..	N	0.37.5	3.75	
Nuremberg	—	X 1	—	—	1,200	—	—	—	—	
Pillau F.S.	Baltic Sea Coast 19° 53′ 27″ E. 54° 38′ 42″ N.	KAP	—	Government ..	600	P R ..	N	0.37.5	3.75	
Sassnitz	Island of Rügen 54° 30′ 52″ N. 13° 39′ 14″ E.	KBV	110	Prussian Railway Administration	375	P R [9] ..	N	0.37.5	3.75	
Staaken	—	SK	—	—	—	—	—	—	—	
Stettin	—	SN	—	—	1,800	—	—	—	—	
Stettin	—	GM	—	—	1,200	—	—	—	—	
Stolpmunde F.S. und F.R.A.	Baltic Sea Coast	KAY	—	Government ..	—	O ..	0600 to 1300 1700 to 2400	—	—	
Stuttgart	—	SG	—	—	1,200	—	—	—	—	
Swinemünde ..	Usedom Island 53° 54′ 55″ N. 14° 16′ 15″ E.	KAW	Day 330 Night 660	Government ..	300, 600, 1,800	P G [8] ..	N	0.37.5	3.75	
Warnemünde F.R.A.	Baltic Sea Coast	KBY	—	Government ..	—	O ..	0600 to 1300 1700 to 2400	—	—	
Warnemünde F.S. ..	Baltic Sea Coast 12° 03′ 04″ E. 54° 10′ 50″ N.	KBE	—	Government ..	—	O ..	0600 to 1300 1700 to 2400	—	—	
Weser Lightship ..	North Sea 53° 54′ 18″ N. 7° 49′ 03″ E.	KBW	80	Government ..	300	P R [1,2] ..	N	0.37.5[2]	3.75[2]	
Wilhemshaven III Einfahrt F.S.	North Sea Coast 8° 09′ 33″ E. 53° 31′ 16″ N.	KAN	—	Government ..	600	P R [15] ..	N	0.37.5	3.75	
GIBRALTAR										
North Front ..	36° 09′ 00″ N. 5° 21′ 00″ W.	BWW	—	British Admiralty	2,700 (spk.) 4,000 (c.w.)	O ..	—	—	—	
Rock (Gibraltar) ..	36° 06′ 00″ N. 5° 21′ 00″ W.	BYW	500	British Admiralty	600 (spk.) 2,800 (c.w.)	P R ..	N	0.60	—	
Gibraltar (Windmill Hill)	36° 06′ 51″ N. 5° 20′ 43″ W.	BYX	—	British Admiralty	—	O ..	—	—	—	
GILBERT AND ELLICE ISLANDS										
Ocean Island ..	0° 30′ 00″ S. 169° 20′ 00″ E.	VQK	1,000	Government of Colony ..	600, 700, 1,650	P G ..	0930, 1530, 2015[8]	0.60	—	

and the transmission of semaphore telegrams originating at or destined for Weser Feuerschiff

[15] A ship requiring bearings should call the station Wilhelmshaven III Einfahrt F.S. (call-signal KAN) on a damped wave of 600 metres. That station makes the necessary arrangements, in conjunction with the three direction finding stations which are concerned, and communicates the position ascertained in longitude and latitude to the ship concerned. These stations are only available for public service when not in use by the Navy. No charge is at present made for the service, which is in the nature of an experiment

[1] The station is connected with the International Telegraph System by wireless through

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
GILBERT AND ELLICE ISLANDS —*contd.*										Nauru, Woodlark Island, and Townsville Radio [2] The station also exchanges official and public correspondence with Nauru, Tulagi, and Apia [3] The station is available at these hours and until traffic is cleared, for working with ships
GOLD COAST COLONY										
Accra..	5° 32′ 23″ N. 0° 12′ 13″ W.	VPG	250	Government ..	300, **600**	P G ..	0800 to 1600 Except Sundays	0.40	—	
GREAT BRITAIN (See **UNITED KINGDOM**)										
GREECE							Eastern European Time			
Athens	37° 58′ 30″ N. 23° 43′ 13″ E.	SXA	—	Government ..	—	O ..	—	—	—	[1] Under construction
Athens, No. 2 ..	37° 58′ 19.7″ N. 23° 43′ 13.8″ E.	SXB	150	—	300, **600**	P G ..	0600 to 2000	0.40	4.00	
Corfou	39° 37′ 11″ N. 19° 54′ 21″ E.	SXK	—	Government ..	—	O ..	—	—	—	
Dédé-Aghadj ..	Thrace 25° 53′ 54″ E. 40° 49′ 52″ N.	SXD	—	—	—	O ..	—	—	—	
Fassa	Andros Is. 40° 57′ 33″ N. 24° 42′ 36″ E.	SXF	—	—	—	O ..	—	—	—	
Poros..	23° 27′ 40″ E. 37° 30′ 08″ N.	SXP	—	—	—	O ..	—	—	—	
Preveza [1]	38° 56′ 00″ N. 20° 46′ 00″ E.	—	—	—	300, 600, 1,200 2,400	—	—	—	—	
Salamis	Island of Salamis 37° 58′ 11″ N. 23° 32′ 02″ E.	SXL	—	Government ..	—	O ..	—	—	—	

Salonique	40° 33′ 43″ N. 22° 57′ 56″ E.	SXC	—	Government ..	—	O ..	—	—	—	
Syra	Island of Syra 37° 25′ 43″ N. 24° 56′ 33″ E.	SXS	—	Government ..	—	O ..	—	—	—	
Thassos	Island of Thassos 40° 46′ 00″ N. 24° 43′ 30″ E.	SXT	—	Government ..	—	O ..	—	—	—	
GUADELOUPE										
Destrellan [3]	16° 15′ 11″ N. 61° 34′ 23″ W.	FKD	400	Government ..	600, 800, 1,200 1,500	P G ..	0600 to 2100	0.30 [2] 0.15 [3]	3.00 [2] 1.50 [3]	[1] The station communi cates with Fort de France and Trinidad [2] For ordinary radio-telegrams [3] For official radio-telegrams
GUAM (See **MARIANNE ISLANDS**)										
GUATEMALA										
Guatemala City ..	—	LVA	1,800	—	1,500, 2,100	P G ..	0700 to 2400	—	—	
Puerto Barrios ..	—	—	—	—	—	P ..	—	—	—	
HAITI (West Indies)										
Port-au-Prince [1] ..	18° 32′ 50″ N. 72° 15′ 10″ W.	NSC	250	U S. Navy ..	300, 600	P G ..	N	0.30	—	[1] Operated by the United States Navy
HAWAIIAN ISLANDS										
Heeia Point	Island of Oahu 21° 26′ 00″ N. 157° 48′ 20″ W.	NPM	200	U.S. Navy ..	300, 600	P G ..	N	0.30	—	[1] The station only communicates with fixed stations [2] C.W. (arc.)
Kahuku	Island of Oahu 21° 16′ 00″ N. 157° 42′ 30″ W.	KIE	4,000	Radio Corporation of America	300, 600, 16,435	P R ..	N	—	—	
Kaunakakai ..	Island of Molokai 21° 05′ 21″ N. 157° 01′ 29″ W.	KHO	30	Mutual Telephone Co., Ltd.	300, 450, 600	—[1]	N	—	—	
Kawaihae	Island of Hawaii 20° 02′ 38″ N. 155° 50′ 05″ W.	KHN	300	Mutual Telephone Co., Ltd.	300, 575, 600	—[1]	N	—	—	
Lahaina	Island of Maui 20° 52′ 29″ N. 156° 40′ 50″ W.	KHL	300	Mutual Telephone Co., Ltd.	300, 575. 600	—[1]	N	—	—	
Lihue..	Island of Kauai 21° 57′ 58″ N. 159° 22′ 16″ W.	KHM	300	Mutual Telephone Co., Ltd.	300, 575, 600	—[1]	N	—	—	
Pearl Harbour ..	Island of Oahu 21° 17′ 54″ N. 157° 51′ 43″ W.	NPM	250	U.S. Navy ..	300, 600, 11,200 [2]	P G ..	N	0.30	—	
Wahiawa	21° 29′ 28″ N. 158° 02′ 37″ W.	KHK	250	Mutual Telephone Co.	300, 550, 600	P G ..	N	0.30	—	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
HERMIT ISLANDS	Meridian of Greenwich.							Francs.	Francs.	
Maron	1° 33′ 00″ S. 145° 02′ 00″ E.	VHR	—	British Admiralty	—	—	—	—	—	
HOLLAND (See **NETHERLANDS**)										
HONG-KONG										
Cape D'Aguilar ..	20° 12′ 30″ N. 114° 15′ 45″ E.	VPS	350	Post Office ..	300, **600**, 1,800	P G [2] ..	N	0.60 [1]	6.00 [1]	[1] This includes the inland charge [2] The station sends out a summary of meteorological conditions and weather forecasts at 0500 and 0900
Stonecutters Island ..	22° 25′ 00″ N. 114° 05′ 00″ E.	BXY	1,000	British Admiralty	600-2,000 (spark) 4,000, 4,200 (arc)	O ..	—	—	—	
ICELAND										
Flatey á Breidafirdi	65° 22′ 30″ N. 22° 55′ 24″ W.	TFB	250	Government ..	300, **600**	P G ..	1100 to 1300 1700 to 1900 2100 to 2300	0.40	4.00	
Hesteyri	—	—	—	—	—	—	—	—	—	
Isafjordur	—	—	—	—	—	—	—	—	—	
Reykjavik Radio ..	64° 08′ 55″ N. 21° 57′ 11″ W.	TFA	500	Government ..	300, **600**, 1,800	P G ..	N	0.40	4.00	
Vestmannaeyjar ..	—	—	—	—	—	—	—	—	—	
ITALIAN SOMALILAND										
Bardera	2° 21′ 10″ N. 42° 16′ 15″ E.	ISN	200	Government ..	700–750	P G ..	Sunrise to sunset	0.30 [1]	—	[1] The charge applicable to the transmission of radiotelegrams between the stations of Italian Somaliland is fixed at fr. 2.52 per radiotelegram of ten words or less, with fr. 0.25[20] additional for each word over ten [2] Italian Somaliland
Brava	Bénadir 1° 06′ 25″ N. 44° 02′ 04″ E.	ISC	120	Government ..	300–**600**	P G ..	Sunrise to sunset	0.60 [1]	—	
Bulo Burti	3° 52′ 00″ N. 45° 34′ 00″ E.	ISJ	100	Government ..	600	P G ..	Sunrise to sunset	0.30	—	
Giumbo	Bénadir 0° 14′ 51″ S. 42° 37′ 27″ E.	ISD	200	Government ..	300–**600**	P G ..	N	0.60 [1]	—	

Iacia Baidoa	3° 07′ 10″ N. 43° 39′ 31″ E.	ISH	160	Government ..	300, 600, 800	P G ..	Sunrise to sunset	0.30 [1]	—	official time, 3 hours in advance of Greenwich time
Itala	Bénadir 2° 45′ 27″ N. 46° 19′ 43″ E.	ISM	50	Government ..	300, 600	P G ..	Sunrise to sunset	0.60 [1]	—	
Lugh	3° 48′ 00″ N. 42° 36′ 00″ E.	ISO	100	Government ..	300	P G ..	Sunrise to sunset	0.30 [1]	—	
Mahaddei Uen ..	2° 58′ 14″ N. 45° 31′ 01″ E.	ISF	160	Government ..	600	P G ..	Sunrise to sunset	0.30 [1]	—	
Merka	Bénadir 1° 42′ 49″ N. 44° 46′ 22″ E.	ISB	50	Government ..	300, 600	P G ..	Sunrise to sunset	0.60 [1]	—	
Mogadiscio ISE ..	Bénadir 2° 02′ 13.5″ N. 45° 21′ 14.5″ E.	ISE	160	Government ..	300, 600	P G ..	N	0.60 [1]	—	
Mogadiscio ISG ..	Bénadir 2° 02′ 13.5″ N. 45° 21′ 14.5″ E.	ISG	—	—	—	—	—	—	—	
Oddur	4° 07′ 05″ N. 43° 45′ 00″ E.	ISI	100-150	Government ..	300, 600	P G ..	0600 to 1800 [2]	0.30	—	
ITALY										
Alessandria	—	G'IA	—	Army	—	—	—	—	—	
Ancona G'IU ..	—	G'IU	—	Army	—	—	—	—	—	
Ancona IQW ..	13° 31′ 50″ E. 43° 37′ 00″ N.	IQW	—	Army	—	—	—	—	—	
Arta Radio	40° 31′ 00″ N. 19° 29′ 00″ E.	IDM	—	Government ..	—	O ..	—	—	—	
Aspio Radio	13° 31′ 25″ E. 43° 31′ 30″ N.	ICA	270	Government ..	300, 600	P G ..	N	0.60	—	
Bologna IGB ..	44° 30′ 00″ N. 11° 20′ 00″ E.	IGB	—	Army	—	O ..	—	—	—	
Bologna G'RH ..	—	G'RH	—	Army	—	—	—	—	—	
Brescia	—	G'RP	—	Army	—	—	—	—	—	
Brindisi Radio ..	Province of Lecce 40° 38′ 45″ N. 17° 57′ 08″ E.	ICE	270	Government ..	300, 600 2400 (arc)	P G ..	N [4]	0.60	—	
Cagliari Radio ICC ..	Sardinia 39° 12′ 30″ N. 9° 33′ 30″ E.	ICC	270	Government ..	300, 600	P G ..	Sunrise to sunset	0.30	—	
Cagliari G'ID ..	—	G'ID	—	Army	—	—	—	—	—	
Capo Sperone Radio	Sardinia, Island of S. Antioco 38° 57′ 59″ N. 8° 24′ 42″ E.	ICR	270	Government ..	300, 600	P G ..	N	0.60	—	
Catania	—	G'IB	—	Army	—	—	—	—	—	
Catanzaro	—	G'IK	—	Army	—	—	—	—	—	
Centocelle	41° 55′ 00″ N. 12° 27′ 00″ E.	ICD	—	—	—	O ..	—	—	—	

[1] Exclusively for the service of the steam ferry boats of the Strait of Messina

[2] Radiotelegrams in plain language, Italian, French or English, concerning the movements and security of ships, and exchanged between the captains of ships and their owners or agents, are accepted

[3] This station is opened for public service direct to Italian Somaliland and Erythrea communicating with Mogadiscio ISG (Italian Somaliland) and Massaua ICX (Erythrea)

[4] Maintains a continuous watch on 600 metre wave. Also performs a limited service for military purposes

[5] Serves Messina Radio in the sector in which the latter is "screened"

[6] D.F. with transmitting apparatus. Ships requiring bearings should call Venezia Radio

Land Stations—*Continued*

Name.	Geographical Position	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
ITALY—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Centopozzi Radio ..	Puglie, Province of Foggia 41° 42′ 00″ N. 15° 36′ 45″ E.	ICM	160	Government ..	300, **600**	P G ..	Sunrise to sunset	0.30	—	[1] Serves for Messina Radio when the latter is occupied with military messages [2] Special service [3] The station also performs a D.F. service for warships
Chieti	—	G'IH	—	Army	—	—	—	—	—	
Civitavecchia Radio	11° 47′ 25.9″ E. 42° 05′ 21″ N.	IDL	120	—	300, **600**	P G ..	N	0.60	—	
Coltano	10° 24′ 06,8″ E. 43° 38′ 35″ N.	ICI	—	Government ..	6,500	—[3]	—	—	—	
Cotrone Radio ..	17° 07′ 56″ E. 39° 04′ 50″ N.	IDH	120	—	300, **600**	P G[2] ..	N	0.60	—	
Cuneo	—	G'IC	—	Army	—	—	—	—	—	
Firenze	43° 40′ 36″ N. 11° 10′ 25″ E.	G'IF	—	Army	—	O ..	—	—	—	
Genova	—	G'IG	—	Army	600	—	Special	—	—	
Genova Radio ..	8° 55′ 56.9″ E. 44° 25′ 44″ N.	ICB	270	Government ..	300, **600**	P G ..	N	0.60	—	
Gugliemo Marconi ..	43° 38′ 35″ N. 10° 24′ 0.67″ E.	ICI	—	—	—	Special	—	—	—	
Lampedusa	12° 37′ 00″ E. 35° 31′ 00″ N.	—	—	—	—	—	—	—	—	
Lipari	14° 57′ 15″ E. 38° 28′ 00″ N.	IDD	—	—	300, **600**	—	Special	—	—	
Livorno	10° 18′ 32.8″ E. 43° 31′ 31″ N.	IDK	—	Government ..	—	—	—	—	—	
Maddalena Radio ..	Strait of Bonifacio, Maddalena Island 41° 12′ 50″ N. 9° 25′ 10″ E.	ICH	270	Government ..	300, **600**	P G ..	N	0.60	—	
Marsala Radio ..	37° 51′ 00″ N. 12° 23′ 00″ E.	IDP	—	Government ..	—	—	—	—	—	
Messina Radio ..	38° 16′ 01″ N. 15° 37′ 27″ E.	ICF	150	Government ..	300, **600**	P G ..	N	0.60	—	
Messina	38° 15′ 00″ N. 15° 37′ 27″ E.	IFM	27	Government (State Railways)	50	O[1] ..	—	—	—	
Milane	45° 20′ 40″ N. 9° 10′ 05″ E.	IGM	—	Army	—	O ..	—	—	—	
Milano	—	G'RJ	—	Army	—	—	—	—	—	
Murano R.G. ..	12° 22′ 20″ E. 45° 27′ 30″ N.	IRM	—	—	300, **600**	D F ..	N	—	—	

Napoli Radio ..	[illegible] 50" E.	[illegible]	[illegible]	[illegible] ..	[illegible] 2,400 (arc)	P G ..	N [4]	0.60	—
Novara	—	G'IN	—	Army	—	—	—	—	—
Otranto Radio ..	40° 09' 00" N. 18° 30' 00" E.	IDG	—	Government ..	—	—	—	—	—
Padova	—	G'RV	—	Army	—	—	—	—	—
Palermo Radio ..	13° 16' 00" E. 38° 11' 50" N.	ICP	270	Government ..	300, 600	P G ..	N	0.30	—
Pantelleria	11° 57' 25" E. 36° 49' 00" N.	ICG	—	—	600	—	Special	—	—
Perugia	—	G'IP	—	Army	—	—	—	—	—
Piacenza	—	G'RK	—	Army	—	—	—	—	—
Pola	13° 50' 50" E, 44° 51' 10° N	IQZ	300	Army	300, 600	P G ..	N	0.60	—
Potenza	—	G'IL	—	Army	—	—	—	—	—
Ravenna	—	G'RF	—	Army	—	—	—	—	—
Reggio Calabria ..	38° 08' 00" N. 15° 38' 30" E.	IFR	27	Government (State Railways)	50	O [1] ..	—	—	—
Roma	—	G'IR	—	Army	—	—	—	—	—
Roma Centocelle ..	12° 33' 06" E, 41° 52' 10" N.	ICD	—	Army	—	O ..	—	—	—
Rome (S. Paolo) [8] ..	41° 52' 00" N. 12° 38' 00" E.	IDO	—	Navy	11,000 (c.w.)	P G [8] ..	—	—	—
Salerno	—	G'IS	—	Army	—	—	—	—	—
Saseno	19° 17' 17" E. 40° 29' 52" N.	IDB	—	Army	—	—	—	—	—
Spezia	9° 49' 03.8" E, 44° 05' 34.6" N.	ICS	—	Army	—	O ..	—	—	—
Stromboli	15° 14' 30" E, 38° 48' 10" N.	IDE	122	Government ..	300, 600	O [7] ..	—	0.60	—
S. Cataldo di Bari ..	16° 50' 47" E. 41° 08' 23" N.	ICQ	120	Army	300, 600	P G ..	N	0.60	—
Taranto	17° 18' 07" E, 40° 28' 02" N	ICT	—	Army	—	O ..	—	—	—
Tempio	Sardinia 40° 53' 56" N. 9° 06' 08" E.	IDR	270	—	2,400 (arc)	P G ..	N	0.60	—
Tivoli Radio ..	44° 53' 12" N. 13° 51' 00" E.	IQV	270	—	300, 600, 3,500	P G [4] ..	N	0.60	—
Torino	45° 00' 20" N. 7° 40' 10" E.	IGT	—	Army	—	O ..	—	—	—
Torino	—	G'IZ	—	Army	—	—	—	—	—
Treviso	45° 30' 53" N. 12° 10' 26" E.	IGV	—	Army	—	O ..	—	—	—
Trieste Radio ..	45° 38' 54" N. 13° 45' 29" E.	IQX	200	—	300, 600	P G ..	N	0.60	—
Ustica	13° 10' 45" E, 38° 42' 25" N.	IDS	—	—	—	—	Special	—	—
Venezia Radio ..	12° 21' 10" E. 45° 28' 50" N.	ICZ	200	—	300, 600	P G ..	N	0.60	—
Verona	—	G'RD	—	Army	—	—	—	—	—
Villa San Giovanni..	Calabria, Strait of Messina 38° 10' 00" N. 15° 38' 00" E.	IFV	27	Government (State Railways)	50	O [1] ..	—	—	—

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge.		Remarks.
								Per Word.	Minimum Charge.	
ITALY—*contd.*	Meridian of Greenwich							Francs.	Francs.	
Vittoria Radio ..	Sicily, Province of Syracuse 14° 32′ 00° E. 36″ 57′ 00″ N.	ICV	270	Government ..	300, **600**	P G ..	N	0.60	—	
JAMAICA (See **BRITISH WEST INDIES**)										
JAPAN										
Chosi Radio.. ..	Hondo, Inuboye Point 35° 44′ 08″ N. 140° 51′ 12″ E.	JCS	Day 450 Night 1,500	Ministry of Communications	300, **600**, 1,800	P G [1] [2] ..	N	0.60	—	
Dairenwan	Peninsula of Kwan-tung 38° 57′ 50″ N. 121° 53′ 15″ E.	JDA	Day 350 Night 1,200	—	300, **600**	P G [2] [4] ..	N [4]	0.60	—	
Fukkikaku	Island of Formosa, Formosa Strait 25° 18′ 00″ N. 121° 32′ 00″ E.	JFK	Day 400 Night 1,260	Ministry of Communications	300, **600**	P G [2] ..	N	0.60	—	
Funabashi Radio ..	Yedo Bay, near Funabashi	JJC	—	Ministry of Marine and Ministry of Communications	4,000-7,000	P G [5] O [6]	—	—	—	
Horomushiro Radio	Paramousir Island 50° 29′ 20″ N. 156° 07′ 30″ E.	JHJ	Day 450 Night 1,500	Ministry of Communications	300, **600**, 1,800	P G [13] ..	N [13]	0.60 [3] [14]	—	
Komonto [7]	Chosen, Island Komonto 34° 05′ 55″ N. 126° 36′ 12″ E.	JKM	Day 200 Night 300	—	—	— [8]	N	—	—	
Maizuru Radio ..	Wakasa Bay, near Maizuru	JMZ		Ministry of Communications	300, **600**, 900-3,500 [8]	P G ..	N	0.60	—	

[1] The station transmits each night (except Sundays) time signals on a wavelength of 600 metres. (See International Time and Weather Signals)

[2] The stations Chosi Radio, Fukkikaku and Dairenwan transmit warnings of typhoons. No charge is made for these messages except when a message is made by the special request of the ship. (See International Time and Weather Signals)

[3] This charge includes the charge applicable to the transmission over the lines of the Japanese telegraph service of radiotelegrams originating in or intended for the empire of Japan or Southern Manchuria; but for urgent radiotelegrams there is an additional charge of fr. 0.25 per word

[4] The greater part of the day, that is, during the

[illegible] ..	[illegible] 33° 51' 40" N. 131° 15' 00" E.	[illegible]	[illegible]	[illegible]	[illegible]	—[11]	[illegible] E. of Greenwich, 1900-2400	—	—
Mokpo [7]	Chosen, port of Mokpo 34° 47' 03" N. 126° 23' 05" E.	JMP	Day 200 Night 300	—	—	—[8]	N	—	—
Osezaki Radio ..	Kyushyu, Goto Islands 32° 37' 20" N. 128° 37' 08" E.	JOS	Day 450 Night 1500	Ministry of Communications	300, 600, 1,800	P G ..	N	0.60	—
Otchishi Radio ..	Hokkaido, Pacific Coast 43° 10' 17" N. 145° 30' 20" E.	JOC	Day 550 Night 1500	Ministry of Communications	300, 600	P G ..	N	0.60	—
Rasajima	Rasa Islands 24° 29' 30" N. 131° 13' 00" E.	JSA	Day 450 Night 1300	Ministry of Communications	300, 600, 1,800	P R [11] ..	—	—	—
Shimotsui Radio ..	Inland Sea 34° 26' 30" N. 133° 48' 05" E.	JSX	Day 300 Night 1000	Ministry of Communications	300, 600, 1,800	P G ..	N	0.60	—
Shiomisaki Radio ..	Hondo, Kii Channel 33° 25' 32" N. 135° 46' 08" E.	JSM	Day 250 Night 1000	Ministry of Communications	300, 600	P G ..	N	0.60	—
Shogetsubito [7] ..	Chosen, port of Chemulpo 37° 28' 19" N. 126° 36' 20" E.	JSB	Day 200 Night 300	—	—	—[8]	N	—	—
Shoseito [7]	Chosen, Island of Shoseito 37° 45' 36" N. 124° 43' 45" E.	JSS	Day 300 Night 400	—	—	—[8]	N	—	—
Tsunoshima Radio ..	Hondo, near Shimonoseki 34° 21' 00" N. 130° 50' 00" E.	JTS	Day 450 Night 800	Ministry of Communications	300, 600	P G ..	N	0.60	—
JUGO-SLAVIA									
Belgrade	44° 47' 57" N. 20° 21' 57.5" E.	HFB	—	—	6,000 to 7,000 (c.w. arc)	—[12]	N	—	—
Sarajevo	43° 52' 00" N. 18° 26' 00" E.	HFC	—	—	2,600 to 6,000 and 600 to 2,800 (c.w.)	—[12]	X	—	—

[illegible] the night [illegible] occupied with official correspondence: 0800–0900, 0930 – 1100, 1130 – 1300, 1330 – 1500, 1530 – 1700, 1730–1800

[5] The station also exchanges public correspondence with Koko Head NPM (Hawaiian Islands)

[6] The station transmits each day time signals on a wavelength of 4,000 metres except Sundays. (See International Time and Weather Signals)

[7] Lighthouse

[8] Correspondence limited to the other lighthouses in Chosen, with the ship Kosai Maru belonging to the Chosen Government and Japanese warships

[9] For official correspondence

[10] The station only corresponds with other fixed stations

[11] Public correspondence with the Japanese ship stations. The station also communicates with the other coast stations in Japan

[12] This station connects with the International Telegraph System through the medium of Otchishi Radio

[13] The station is open approximately from May 1st to September 30th

[14] This charge includes the charge for transmission between Horomushiro Radio and Otchishi Radio

[1] Communicates only with fixed stations

[2] Sends meteorological message at 1345 hours daily (G.M.T.)

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
KINGDOM OF SERBS CROATS AND SLOVENES	Meridian of Greenwich.							Francs.	Francs.	
Herzegnovi	18° 32′ 14″ E. 42° 27′ 00″ N.	UNK	400	Ministry of War and Navy	**600**, 1,800	—[1]	—	—	—	[1] Provisionally, military station
Skoplje	21° 25′ 30″ E. 42° 00′ 18″ N.	HFS	—	—	2,500, 4,000 (c.w.)	—[2]	X	—	—	[2] The station only corresponds with fixed stations
LATVIA										
Libau RED	56° 30′ 00″ N. 21° 05′ 00″ E.	RED	—	—	360	O ..	—	—	—	
Libau ROL ..	Baltic Sea 56° 31′ 40″ N. 20° 50′ 00″ E.	ROL	170	—	300, 420, **600**	P G ..	0600 to 2200	0.60	—	
Riga	56° 59′ 53″ N. 24° 06′ 15″ E.	RRG	160	—	300, 420, **600**	P G ..	0600 to 2200	0.60	—	
LIBERIA										
Monrovia	6° 16′ 40″ N. 10° 49′ 36″ W.	FMA	400	French Government	600	P G ..	Sunrise to sunset	0.30	—	
MACAO										
S. Francisco, Macau	113° 33′ 42″ E. 22° 11′ 36″ N.	CRS	Day 50 Night 100	Portuguese Postal and Telegraph Administration	300, **600**	P R ..	0700 to 0800, 1200 to 1400, 1900 to 2200 (local time)	0.60	6.00	
MADAGASCAR										[1] The station also communicates by radiotelegraphy with Dzaoudzi. In case of interruption of the inland telegraph lines, the Diégo-Saurez and Majunga stations exchange by radiotelegraphy the inland and international correspondence
Ambohibe [4]	—	—	—	—	—	—	—	—	—	
Diégo-Suarez ..	North of Madagascar 12° 15′ 04″ S. 49° 22′ 14″ E.	FDG	Day 325 Night 650	French Government	300, **600**	P G [1 2] ..	0700 to 1100 [3] 1330 to 1700 1900 to 2100	0.50	—	
Maintirano [4] ..	18° 11′ 00″ S. 44° 00′ 00″ E.	—	—	—	—	—	—	—	—	
Majunga	Mozambique Channel 15° 43′ 00″ S. [illegible]	FJA	430	French Government	300, **600**	P G [1 2] ..	0700 to 1100 [3] 1330 to 1700 1900 to 2000	0.50	—	[2] A service giving warn- [illegible]

Tananrive[4] ..	[illegible] E.	—	—	—	—	—	—	—	—	[illegible]
Tulléar[4]	[illegible] S. 43° 45′ 00″ E.	—	—	—	—	—	—	—	—	[3] Third [illegible] of the Greenwich belt [4] Under construction
MALAY PENINSULA										
Penang Radio ..	5° 32′ 03.12″ N. 100° 22′ 51.4″ E.	VPX	Day 350 Night 700	Straits Settlements Government	600	P G ..	N	0.60	—	
Singapore Radio ..	1° 20′ 22.55″ N. 103° 53′ 24.75″ E.	VPW	Day 350 Night 700	Straits Settlements Government	600, 1,800	P G ..	0600 to 2400 Sundays: 0800 to 1000 1430 to 1630 2000 to 2200	0.60	—	
Singapore (Seletar) ..	1° 23′ 26.87″ N. 103° 51′ 46.50″ E.	BXW	1,000	British Admiralty	600-2,000 (spark) 4,000 (arc)	O ..	—	—	—	
MALTA										
Malta Island (St. George's)	35° 55′ 17″ N. 14° 29′ 24″ E.	VPT	200	Eastern Telegraph Co.	2,800 (c.w.)	—	—	—	—	[1] The station sends out weather bulletins at 0900 and 2100 (G.M.T.) on a wavelength of 4,200 metres (c.w.)
Rinella Bay, Malta ..	35° 53′ 00″ N. 14° 32′ 00″ E.	BYZ	—	British Admiralty	2,700 (spark) 4,200[1]	O ..	—	—	—	
S. Angelo, Malta ..	35° 53′ 00″ N. 14° 31′ 00″ E.	BYY	500	British Admiralty	600 (spark)	P G, O ..	N	0.60	—	
MARIANNE ISLANDS										
Guam[1]	13° 27′ 15″ N. 144° 44′ 42″ E.	NPN	150	U.S. Navy ..	300, 600	P G ..	N	0.30[2]	—	[1] Operated by the United States Navy [2] No charge is made for relaying messages
MARSHALL ISLANDS										
Nauru	Pleasant Island 0° 25′ 24″ S. 166° 57′ 00″ E.	VKT	2,000	Australian Government	300, 450, 600	P G[1] ..	N	0.30[2] 0.60[3]	—	[1] This station is connected with the International Telegraph System by wireless through Woodlark Island and Townville Radio [2] For radiotelegrams to and from ships licensed by the Commonwealth of Australia and New Zealand Administrations [3] For radiotelegrams to and from ships licensed by other Administrations
MARTINIQUE										
Fort de France ..	14° 35′ 50″ N. 61° 04′ 00″ W.	FKQ	300	French Navy ..	600, 800[1], 1,000[1]	P G[2] ..	N	0.30[3]	—	[1] For official correspondence [2] General public correspondence may be ad-

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
MARTINIQUE—*contd.*	Meridian of Greenwich.							Francs.	Francs.	mitted if the station is not engaged with official correspondence [2] Radiotelegrams to or from officers or crew of warships are free of charge
MAURITIUS										
Mauritius	20° 10′ 00″ S. 57° 35′ 00″ E.	BZG	500	British Admiralty	600-2,000(spk) 4,000 (arc)	P G [1] ..	N	0.60	—	[1] Weather reports from ships are sent to the observatory. If necessary, the observatory forwards a weather report to ships at sea
MEXICO							Mean time of the meridian of Tacubaya.[1]			[1] Mean time of the meridian of Tacubaya: six hours 36 minutes 46.67 seconds later than Greenwich time [2] The station also exchanges ordinary telegrams originating in or intended for the peninsula of Yucatan [3] The station transmits daily at noon, time signals and a weather report. (See International Time and Weather Signals) [4] The station also exchanges ordinary telegrams originating in or intended for Lower California [5] For correspondence with fixed stations [6] Time signals are sent on 5,800 metre wave at 0055 to 0100 (G.M.T.) and on 1,200 metre wave at 1200.
Acapulco de Guerrero	16° 50′ 41″ N. 99° 54′ 26″ W.	XAK	300	Government ..	**600**, 900,[5] 1,200[5]	P G ..	0800 to 2200	0.45	4.50	
Alamos de Sonora ..	27° 01′ 19″ N. 108° 55′ 59″ W.	XAD	500	Government ..	**600**, 900,[5] 1,200[5]	P G ..	0800 to 2200	0.45	4.50	
Campeche	19° 50′ 47″ N. 90° 32′ 14″ W.	XAB	300	Government ..	**600**, 900,[5] 1,200[5]	P G [2,3]	0800 to 2200	0.45	4.50	
Chapultepec (Mexico City)	19° 30′ 00″ N. 98° 30′ 00″ W.	XDA	—	Government ..	—	—[6]	—	—	—	
Guaymas	Sonora 27° 55′ 30″ N. 110° 53′ 34″ W.	XAH	200	Government ..	**600**, 900,[5] 1,200[5]	P G [3] ..	0800 to 2200	0.45	4.50	
Isla Maria Madre ..	Noyarit 106° 33′ 14″ W. 21° 30′ 45″ N.	XAO	300	Government ..	**600**, 900, 1,200	P G ..	0800 to 1900	0.45	4.50	
La Paz de la Baja, California	Gulf of California 24° 10′ 12″ N. 110° 21′ 05″ W.	XAF	300	Government ..	**600**, 900,[5] 1,200[5]	P G ..	0800 to 2200	0.45	4.50	
Mazatlán de Sinaloa	Sinaloa 23° 11′ 55″ N. 106° 25′ 20″ W.	XAE	300	Government ..	**600**, 900,[5] 1,200[5]	P G [2,4]	0800 to 2200	0.45	4.50	
Merida de Yucatan..	20° 58′ 05″ N. 89° 37′ 21″ W.	XAM	300	Government ..	**600**, 900,[5] 1,200[5]	P G ..	0800 to 2200	0.45	4.50	
Payo Obispo ..	Quintana Roo 18° 29′ 39″ N. 88° 21′ 30″ W.	XAC	300	Government ..	**600**, 900,[5] 1,200[5]	P G [3] ..	0800 to 2200	0.45	4.50	

Puerto Lobos ..	Vera Cruz 21° 28′ 00″ N. 97° 13′ 03″ W.	XAL	300	Government ..	**600**, 900,[5] 1,200[5]	P G ..	0800 to 2200	0.45	4.50
Salina Cruz	Oaxaca 16° 09′ 37″ N. 95° 12′ 11″ W.	XAN	300	Government ..	**600**	P G ..	0800 to 2200	0.45	4.50
S. Rosalia de la Baja, California	Lower California 27° 24′ 00″ N. 112° 20′ 00″ W.	XAG	100	Government ..	**600**	P G[4] ..	0800 to 2200	0.45	4.50
Tampico de Tamaulipas	22° 13′ 00″ N. 97° 51′ 19″ W.	XAJ	300	Government ..	**600**, 900,[5] 1,200[5]	P G ..	0800 to 2200	0.45	4.50
Túxpan de Veracruz	20° 57′ 18″ N. 97° 23′ 59″ W.	XAI	300	Government ..	**600**, 900,[5] 1,200[5]	P G ..	0800 to 2200	0.45	4.50
Veracruz de Veracruz	19° 12′ 02″ N. 96° 08′ 16″ W.	XAA	500	Government ..	**600**, 900,[5] 1,200[5]	P G[1 3]	0800 to 2200	0.45	4.50
MOROCCO									
Agadir	30° 26′ 15″ N. 9° 36′ 30″ W.	CNA	500	Navy (French) ..	**600**, 800, 1,000	O ..	N	—	—
Casablanca, Maroc ..	33° 36′ 30″ N. 7° 37′ 00″ W.	CNP	430	Navy (French) ..	300, **600**	P G ..	0600 to 2400	0.25[1] (a)	—
Chetaba Gonio[2 4] ..	33° 35′ 21″ N. 7° 34′ 10″ W.	CNP	—	Navy (French) ..	450	D F[3] ..	N	—	—
Ceuta..	35° 48′ 40″ N. 5° 16′ 24″ W.	EGD	320	Army (Spanish)	900, 1,200, 1,590	O ..	N	—	—
Fez	—	—	—	French Government	—	O ..	—	—	—
Kenitra	—	CNK	150	Navy (French) ..	**600**, 800	O ..	0800 to 1000 1200 to 1400 1600 to 1800 2000 to 2200	—	—
Larache	35° 12′ 00″ N. 6° 12′ 00″ W.	EGF	220	Army (Spanish)	600, 900, 1,200	O ..	N	—	—
Médiouna[3]	33° 27′ 15″ N. 7° 31′ 20″ W.	HWM	—	Navy (French) ..	3,000	—	—	—	—
Melilla	35° 18′ 15″ N. 2° 56′ 25″ W.	EGB	320	Army (Spanish)	600, 1,200, 1,600	O	N	—	—
Mogador	31° 31′ 00″ N. 9° 46′ 00″ W.	CNY	430	French Government	300, **600**	P G ..	0600 to 2400	0.25[1] (b)	—
Rabat	34° 02′ 15″ N. 6° 50′ 30″ W.	CNF	110	French Government	450	O ..	0600 to 0700 1800 to 1900	—	—
Tanger	35° 47′ 15″ N. 5° 49′ 00″ W.	CNW	430	French Government	300, **600**	P G ..	0600 to 2400	0.25[1] (c)	—
Tetuan	30° 45′ 50″ N. 5° 22′ 50″ W.	EGK	320	Army (Spanish)..	900, 1,200, 1,590, 2,000	O ..	—	—	—
NAVASSA ISLAND									
Navassa Islands, W.I.	Windward Passage 18° 25′ 00″ N.[1] 74° 00′ 00″ W.	NKC	125	U.S. Navy ..	300, **600**	P G ..	N	0.30	—

[1] In the case of radiotelegrams originating at or intended for the place named against the letter in the reference the charge for transmission between such place and the coast station concerned is included in the coast tax: a. Casablanca, Maroc; b. Mogador; c. Tanger

[2] Direction finding station; transmission done by Casablanca, Maroc, CNP

[3] Under construction

[4] A charge of fr. 6 will be made for each bearing. The French State accepts no responsibility on account of the radio compass work

[1] Approximately

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge.		Remarks.
								Per Word.	Minimum Charge.	
NETHERLANDS	Meridian of Greenwich.							Francs.	Francs.	
Amsterdam	52° 22′ 27″ N. 4° 54′ 45″ E.	PCA	—	Government	600	O	—	—	—	
Apeldoorn (Gelderland) [4]	—	—	—	—	—	—	—	—	—	
Commandementsgebouw Willemsoord	52° 57′ 49.5″ N. 4° 46′ 33″ E.	—	—	—	—	—	—	—	—	
De Mok	53° 00′ 02″ N. 4° 45′ 56.5″ E.	PCE	40	—	600	O	X	—	—	
Doggersbank Noord Lightship	56° 00′ 00″ N. 5° 00′ 00″ E.	PCP	40	Government	300, **400**, 600	— [1]	X	— [2]	—	
Doggersbank Zuid Lightship	54° 45′ 00″ N. 3° 58′ 30″ E.	PCR	100	Government	300, **400**, 600	— [1]	X	— [2]	—	
Flushing	51° 26′ 52″ N. 3° 35′ 35″ E.	PCD	200	—	600	O	X	—	—	
Haaks Lightship	To the West of Helder 52° 58′ 00″ N. 4° 18′ 31″ E.	PCO	40	Government	300, **400**, 600	— [1]	X	— [2]	—	
Helder PCB	52° 57′ 49″ N. 4° 46′ 33″ E.	PCB	—	Government	600	O	—	—	—	
Helder PCC	4° 46′ 23.5″ E. 52° 57′ 05″ N.	PCC	—	—	600	O	— [5]	—	—	
Hellevoetsluis	51° 49′ 30″ N. 4° 08′ 00″ E.	PPC	—	Government	—	O	—	—	—	
Kazerne Onderzeedienst Willemsoord	52° 57′ 05″ N. 4° 46′ 23.5″ E.	—	—	—	—	—	—	—	—	
Noord-Hinder Lightship	North Sea 51° 35′ 20″ N. 2° 36′ 43″ E.	PCN	40	Government	300, **400**, 600	— [1]	X	— [2]	—	
Scheveningen-Port	North Sea Coast, near The Hague 52° 05′ 40″ N. 4° 15′ 30″ E.	PCH	250	Government	300, 500, **600**, 1,800	P G [3]	N	0.40	4.00	
[illegible] Lightship	53° 29′ 00″ N. [illegible]	PCM	40	Government	300, **400**, **600**	— [1]	X	— [2]	—	

[1] The station is intended for: (a) The transmission to the Scheveningen-Port coast station of telegrams received by means of flag signals from ships passing within sight, or the retransmission by means of these signals, to such ships, of telegrams sent to it through the Scheveningen-Port coast station; (b) meteorological services

[2] Telegrams originating on or intended for ships and forwarded through Scheveningen-Port are subject to the charge for transmission over the inland telegraph lines, and a fixed charge of fr. 1.00 per telegram

[3] The station transmits daily except Sundays and holidays a meteorological telegram on the wavelength of 1,800 metres. (For particulars, see International Time and Weather Signals — Holland)

[4] Under construction

[5] As a rule only the station Helder PCB is open for correspondence. Helder PCC is a reserve station which takes the place of Helder PCB [illegible]

NEW BRITAIN										
Rabaul Radio ..	4° 23′ 50″ S. 152° 18′ 15″ E.	VJZ	2,000	Australian Government	300 450, **600**	P G [1] ..	N	0.30 [2] 0.60 [3]	—	[1] The station is connected with the International Telegraph System by wireless through Woodlark Island and Townsville Radio [2] For radiotelegrams to and from ships licensed by the Commonwealth of Australia and New Zealand Administrations [3] For radiotelegrams to and from ships licensed by other Administrations
NEW CALEDONIA (See **FRENCH OCEANIA**)										
NEWFOUNDLAND (See under **CANADA**)										
NEW GUINEA										[1] The station is connected to the International Telegraph System through Port Moresby and Thursday Island Radio by wireless [2] When necessary, or when requested by vessels, the station transmits weather forecasts [3] The station is connected to the International Telegraph System by wireless through Thursday Island Radio [4] In the case of radiotelegrams originating at or intended for Port Moresby the local land charge is included in the coast tax [5] For radiotelegrams exchanged with ships subject to the administration of Australia or of New Zealand [6] For radiotelegrams exchanged with ships other than those subject to the administration of Australia or of New Zealand
Eitape Radio ..	3° 08′ 02″ S. 142° 21′ 02″ E.	VZX	200	Australian Government	300, **600**	P G ..	0600 to 0700 0900 to 1000 1300 to 1400 1700 to 2000	0.30 [5] 0.60 [6]	—	
Madang Radio .	5° 12′ 40″ S. 145° 49′ 30″ E.	VIV	200	Australian Government	300, **600**	P G [1] ..	0600 to 0700 0900 to 1000 1300 to 2300	0.30 [5] 0.30 [6]	—	
Morobe Radio ..	7° 45′ 30″ S. 147° 39′ 03″ E.	VZK	200	Australian Government	300, **600**	P G ..	0600 to 0700 0900 to 1000 1300 to 1400 1700 to 2000	0.30 [5] 0.30 [6]	—	
Port Moresby Radio	9° 28′ 00″ S. 147° 09′ 00″ E.	VIG	500	Australian Government	300, 450. **600**	P G [2,3] ..	0700 to 1900 Sundays closed	0.30 [4,5] 0.60 [4,6]	—	
Samarai Radio ..	10° 36′ 49″ S. 150° 39′ 46″ E.	VIJ	350	Australian Government	300, 450, **600**	P G ..	—	0.30 [5] 0.60 [6]	—	
Woodlark Island Radio	9° 05′ 00″ S. 152° 45′ 00″ E.	VIF	1,000	Australian Government	300, 450, **600**	P G ..	N	0.30 [5] 0.60 [6]	— —	
NEW HEBRIDES (See **FRENCH OCEANIA**)										

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
NEW IRELAND	Meridian of Greenwich.							Francs.	Francs.	
Kaewieng	2° 34′ 30″ S. 150° 48′ 45″ E.	VZR	200	Australian Government	300, **600**	P G ..	0600 to 0700 0900 to 1000 1300 to 1400 1700 to 2000	0.30 [2] 0.60 [3]	—	[1] Mean time of the meridian of 142° 30′ E. of Greenwich [2] For radiotelegrams to and from ships licensed by the Commonwealth of Australia or New Zealand Administration [3] For radiotelegrams to and from ships other than that licensed by the Australian or New Zealand Administration
NEW ZEALAND							Mean time of New Zealand [1]			
Auckland Radio ..	36° 50′ 37″ S. 174° 46′ 08″ E.	VLD	300	Government ..	300, **600**,	P G ..	N	0.63 [2 3 4] 0.31.5 [2 3 4]	—	[1] In advance of Greenwich time by 11 hours 30 minutes [2] Rate applicable to radiotelegrams to or from vessels not registered in New Zealand or Australia or not trading exclusively between New Zealand and Australia or on the New Zealand coast [3] Rate applicable to radiotelegrams to or from vessels registered in New Zealand or Australia and those trading exclusively between New Zealand and Australia or on the New Zealand coast [4] For press radiotelegrams from ship stations, the coast station rate is 3 fr. 15 centimes per 100 words or fraction thereof
Awanui Radio ..	Auckland, Mongonui 34° 54′ 00″ S. 173° 18′ 00″ E.	VLA	Day 300 Night 600	Government ..	300, **600**, 1,000, 2,000, 2,500, 3,500	P G [4] ..	0800 to 0100 [5]	0.63 [2 3 4] 0.31.5 [2 3 4]	—	
Awarua Radio ..	Otago, near Bluff Harbour 46° 30′ 00″ S. 168° 23′ 00″ E.	VLB	Day 300 Night 600	Government ..	300, **600**, 1,000, 2,000, 2,500, 3,500	P G [4] ..	1830 to 2400 [5]	0.63 [2 3 4] 0.31.5 [2 3 4]	—	
Chatham Islands ..	43° 57′ 00″ S. 176° 57′ 00″ W.	VLC	300	Government ..	300, **600**	P G ..	1600 to 2400	0.63 [2 3 4] 0.31.5 [2 3 4]	—	
Rarotonga	21° 12′ 00″ S. 159° 48′ 30″ W.	VMR	Day 500 Night 850	Government ..	300, **600**, 1,700	P G ..	1800 to 0200	0.63	—	
Wellington Radio ..	41° 17′ 05″ S. 174° 46′ 39″ E.	VLW	300	Government ..	300, **600**	P G [4 5] ..	N	0.63 [2 3 4] 0.31.5 [2 3 4]	—	

NICARAGUA										
Managua	12° 15′ 00″ N. 86° 01′ 00″ W.	NAZ	100	U.S. Navy ..	600, 752, 952	O ..	N	0.30	—	
NIGERIA										
Lagos	6° 26′ 35″ N. 3° 23′ 55″ E.	VPY	250	African Direct Cable Co. ..	300, 600	P G ..	0700 to 2100 Sundays: 0800 to 1000 1600 to 1800	0.60	—	
NORWAY							Central European Time.			
Bergen Radio ..	North Sea Coast 60° 24′ 30″ N. 5° 22′ 00″ E.	LGN	Day 270 Night 1000	Government ..	300, 600	P G ..	N	0.40	4.00	
Björnöen Radio ..	Arctic Ocean 74° 27′ 45″ N. 19° 17′ 15″ E.	LWP	225	Björnöen A/S Stavanger	1,600, 600	P R[7] ..	—	—	—	
Fauske[8]	67° 15′ 28.10″ N. 15° 23′ 17.35″ E.	—	—	—	600, 2,000	—	—	—	—	
Flekkeröy Radio ..	Skager Rak 58° 04′ 05″ N. 7° 59′ 00″ E.	LDF	Day 160	Government ..	300, 600	P G ..	N[1]	0.40	4.00	
Ingöy DF	71° 04′ 26.43″ N. 24° 09′ 24.94″ E.	LEI	—	Government ..	—	D F ..	N	—	—	
Ingöy Radio ..	To the West of North Cape 71° 04′ 26.58″ N. 24° 09′ 25.48″ E.	LEI	480	Government ..	300, 600	P G ..	N[2] 0800 to 2100[3]	0.40	4.00	
Karljohansvern Radio	Kristiania Fjord 59° 25′ 45″ N. 10° 29′ 25″ E.	LBZ	—	Government ..	—	O ..	—	—	—	
Kings Bay[8]	79° 01′ 00″ N. 12° 20′ 00″ E.	—	—	—	300, 600, 1,800	—	—	—	—	
Kristiania Radio ..	Near Kristiania 59° 59′ 20″ N. 10° 41′ 20″ E.	LCH	—	Government ..	8,000 (c.w.)	O ..	—	—	—	
Röst DF	67° 30′ 22.86″ N. 12° 04′ 33.70″ E.	LFR	—	Government ..	—	D F ..	—	—	—	
Röst Radio	Lofoten Islands 67° 30′ 24″ N. 12° 04′ 45″ E.	LFR	35	Government ..	300, 600	P G[4] ..	0900 to 1300 1600 to 1930 Holidays: 0800 to 1000	0.40	4.00	
Sörvaagen Radio ..	Lofoten Islands 67° 53′ 30″ N. 13° 02′ 00″ E.	LEN	35	Government ..	300, 600	P G[4] ..	0900 to 1300 1600 to 1930 Holidays: 0800 to 1000	0.40	4.00	

[5] In addition, a continuous listening service for distress signals is maintained

[6] Meteorological radiotelegrams are sent free of charge at the following hours (except Saturdays and Sundays):
Awarua Radio 8.30 p.m.
Wellington Radio 9 p.m.
Awanui Radio 10 p.m.

[7] The relaying rate is 42 centimes per word

[8] Time signals are sent free of charge on Tuesdays and Fridays at 8.30 p.m.

[1] The night service is performed alternately by the Flekkeröy Radio and Tjöme stations. Flekkeröy Radio is open during the nights of Tuesday, Thursday and Saturday. Tjöme is open during the nights of Monday, Wednesday, and Friday. The service between 0800 Sunday and 0800 Monday is performed alternately by the two stations

[2] During the months from May to September

[3] During the months from October to April

[4] Röst and Sörvaagen intercommunicate by wireless

[5] Transatlantic public service to U.S.A.

[6] For communication with Sörvaagen and Röst Radio

[7] For communication with Ingöy Radio

[8] Under construction

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
NORWAY—*contd.*										
Spitsbergen (see under Spitzbergen)										
Stavanger Radio ..	58° 58′ 00″ N. 5° 45′ 00″ E.	LCM	—	Government ..	—	—[3]	—	—	—	
Tjöme Radio ..	Kristiania Fjord 59° 03′ 05″ N. 10° 24′ 05″ E.	LET	Day 100	Government ..	600	P G ..	N[1]	0.40	4.00	
Trondhjem[3]	63° 25′ 00″ N. 10° 25′ 00″ E.	—	—	—	—	—	—	—	—	
Utsire Radio ..	North Sea Coast 59° 18′ 10″ N. 4° 55′ 08″ E.	LGK	230	Government ..	300, **600**	P G ..	N	0.40	4.00	
Væröy Radio ..	67° 40′ 20″ N. 12° 41′ 30″ E.	—	—	Government ..	—	P R[3] ..				
PANAMA										
Balboa	Pacific entrance of the Panama Canal 8° 57′ 00″ N. 79° 33′ 30″ W.	NBA	150	U.S. Navy ..	300, **600**, 7,000[2]	P G ..	N	0.30	—	[1] Approximately [2] C.W. (arc) [3] The station only communicates with fixed stations
Cape Malai	7° 30′ 00″ N.[1] 80° 00′ 00″ W.	NNT	250	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
Coco Solo	9° 23′ 10″ N. 79° 53′ 11″ W.	NNL	250	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
Colon..	Atlantic entrance of the Panama Canal 9° 22′ 08″ N. 79° 53′ 07″ W.	NAX	250	U.S. Navy ..	300, **600**, 1,500	P G ..	N	0.30		
Darien Panama ..	9° 07′ 15″ N. 79° 46′ 20″ W.	NBA	250	U.S. Navy .	300, **600**	P G ..	N	0.30	—	
Palma, Panama (La)	Stanley Island 8° 26′ 00″ N. 78° 08′ 30″ W.	NNW	250	U.S. Navy ..	300, **600**	—[3]	0500 to 1000 1200 to 1500 1700 to 2000	—	—	

Station	Position	Call	Range	Owner	Wave-lengths	Service	Hours	Coast charge	Ship charge	Remarks
Puerto Obaldia	8° 40′ 00″ N. 77° 22′ 00″ W.[1]	NRK	250	U.S. Navy	300, 600	—[1]	0600 to 0800 1200 to 1400 1800 to 2000	—	—	
PARAGUAY										
Asuncion	—	—	—	Government	—	P G[1]	—	—	—	[1] The station is open for public correspondence in the inland service
Concepcion	—	—	—	Government	—	P G[1]	—	—	—	
Encarnacion	—	—	—	Government	—	P G[1]	—	—	—	
PERIM										
Perim	Straits of Babel Mandeb	BVQ	—	British Admiralty	—	O	—	—	—	
PERSIAN GULF										
Bahrein	26° 13′ 46″ N. 50° 35′ 28″ E.	VTE	350	Indo-European Telegraph Dept.	300, 600	P G[1]	0430 to 1330	0.40	—	[1] Communicates also with Bushire [2] Communicates also with Basrah and Bahrein [3] Communicates also with Henjam
Basrah	Shat el Arab 30° 31′ 00″ N. 47° 52′ 00″ E.	VTC	—	British Government	—	O	—	0.35	—	
Bushire	28° 54′ 36″ N. 50° 49′ 43″ E.	VTB	350	Indo European Telegraph Dept.	300, 600	P G[2]	N	0.40	—	
Henjam	26° 41′ 14″ N. 55° 53′ 25″ E.	VTH	300	Indo-European Telegraph Dept.	300, 600	P G	N	0.40	—	
Lingah	26° 33′ 34″ N. 54° 53′ 23″ E.	VTL	300	Indo-European Telegraph Dept.	300, 600	P G[3]	0415 to 1415	0.40	—	
PERU	Meridian of Paris.							Sols. Peruvian.	Sols Peruvian.	
Cachendo	16° 58′ 00″ S. 72° 03′ 00″ W.	OAB	650	Government	600, 3,500	P G	—[1]	0.12[2]	—	[1] The station is prepared to receive calls chiefly during the first 15 minutes of each of its hours of service [2] The coast charge given is applicable to radiotelegrams worded in plain Spanish language; for radiotelegrams in code or worded in language other than Spanish the coast charge is doubled [3] Interior station [4] Under construction
Cajamarca[4]	—	—	—	—	—	—	—	—	—	
Callao	12° 03′ 53″ S. 79° 28′ 34″ W.	OAA	180	Government	600	P G	0800 to 1200 1400 to 1700 1900 to 2200	0.12[2]	—	
Chala	15° 40′ 20″ S. 76° 38′ 49″ W.	OAC	240	Government	600, 760	P G	0800 to 1200 1400 to 1700 1900 to 2200	0.12[2]	—	
Eten	—	OAG	—	Government	600, 1,500	P G	—	0.12[2]	—	
Ilo	17° 36′ 50″ S. 73° 40′ 44″ W.	OAL	240	Government	600, 730	P G	0800 to 1200 1400 to 1700 1900 to 2200	0.12[2]	—	
Iquitos[3]	3° 45′ 57″ S. 75° 36′ 56″ W.	OAY	900	Government	600, 1,500, 2,000, 2,500, 3,000, 3,500	P G	0800 to 2400	0.24[2]	—	
Masisea[3]	8° 35′ 48″ S. 76° 40′ 50″ W.	OAM	240	Government	2,000	P G	0600 to 1700	0.24[2]	—	
Orellana[3]	6° 54′ 55″ S. 77° 31′ 15″ W.	OAO	240	Government	2,000	P G	0600 to 1700	0.24[2]	—	
Palta[4]	—	—	—	—	—	—	—	—	—	
Pisco	13° 42′ 40″ S. 78° 32′ 38″ W.	OAP	180	Government	600	P G	0800 to 1200 1400 to 1700 1900 to 2200	0.12[2]	—	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
PERU —*contd.*	Meridian of Paris.							Sols. Peruvian.	Sols. Peruvian.	
Puerto Bermudez[3] ..	10° 18′ 00″ S. 77° 17′ 45″ W.	OAE	240	Government ..	2,000	P G ..	0600 to 1700	0.24[2]	—	
Putumayo[3]	2° 05′ 00″ S. 72° 40′ 00″ W.	OAU	600	Government ..	2,000	P G ..	1900 to 2400	0.24[2]	—	
Requena[3]	8° 28′ 00″ S. 76° 13′ 00″ W.	OAQ	240	Government ..	2,000	P G ..	0600 to 1700	0.24[2]	—	
Salaverny[4]	—	—	—	—	—	—	—	—	—	
San Cristobal (Lima)	12° 03′ 06″ S. 79° 22′ 54″ W.	OAZ	900	Government ..	600, 1,500, 2,000, 3,000, 3,500, 4,000	P G ..	0800 to 2400	0.12[2]	—	
Trujolli	—	OAT	—	Government ..	600, 1,500	P G ..	—	0.12[2]	—	
PHILIPPINE ISLANDS	Meridian of Greenwich.						Mean time of the Islands.[1]	Francs.	Francs.	
Amuguis	—	KDRF	—	Government ..	—	—	—	—	—	[1] Mean time of the meridian 120° east of Greenwich [2] Stations have been dismantled for re-erecting on other sites. [3] Under construction [4] C.W. (arc)
Balabac[2]	Palawan Islands	—	—	—	—	—	—	—	—	
Batangas	Luzon	KUXK	—	Government ..	—	—	—	—	—	
Bongao[2]	Sulu	—	—	Government ..	—	—	—	—	—	
Cagayan Sulu[2] ..	Sulu	—	—	Government ..	—	—	—	—	—	
Camotes Islands[2] ..	Cebu Islands	—	—	—	—	—	—	—	—	
Camp John Hay ..	—	WUCB	—	U.S. Signal Corps	—	—	—	—	—	
Camp Stotsenburg ..	—	WUCA	—	U.S. Signal Corps	—	—	—	—	—	
Cavite	14° 28′ 59″ N. 120° 54′ 35″ E.	NPO	250	U.S. Navy ..	300, **600** 925, 5,000[4]	P G ..	N	0.30	—	
Cebu	Cebu Islands 10° 25′ 00″ N. 123° 50′ 00″ E.	KUXJ	—	Government ..	—	—	—	—	—	
Cuabo[2]	6° 51′ 00″ N. 126° 04′ 20″ E.	CB	50	Government ..	600	P G ..	0800 to 1730	0.30	—	
Culion	Culion Island 11° 50′ 00″ N. 120° 02′ 00″ E.	KDLQ	—	Government ..	**600**, 1,200	—	—	—	—	
Cuyo	10° 51′ 25″ N. 121° 00′ 20″ E.	WVX	150	Government ..	**600**, 1,200	P G ..	0700 to 1815	0.30	—	
Davao[2]	Mindanao 7° 04′ 00″ N. 125° 36′ 20″ E.	WVO	200	U.S Army ..	**600**, 1,200	P G ..	0700 to 1800	0.30	—	
Fort Drum	Manila Bay, El Fraile Island 14° 18′ 23″ N. 120° 37′ 43″ E.	WVP	30	U.S. Army	430	O ..	—	—	—	

Fort Frank	Manila Bay, Carabao Island 14° 16′ 20″ N. 120° 36′ 45″ E.	WVL	50	U.S. Army ..	—	O ..	—	—	—
Fort Mills WVN ..	Manila Bay, 14° 22′ 52″ N. 120° 34′ 40″ E.	WVN	500	U.S. Army ..	300, **600**, 825, 1,200	O ..	N	—	—
Fort Mills WVZ ..	Manila Bay, Corregidor Island 14° 22′ 52″ N. 120° 34′ 40″ E.	WVZ	125	U.S. Army ..	600	O ..	—	—	—
Fort Wint	Manila Bay, Grande Island 14° 46′ 15″ N. 120° 13′ 25″ E.	WVR	125	U.S Army ..	1,200	O ..	X	—	—
Iloilo	Panay 10° 40′ 00″ N. 122° 35′ 00″ E.	KUVM	—	Government ..	—	—	—	—	—
Isabel de Basilan ..	6° 40′ 00″ N 121° 50′ 50″ E.	KHI	20	Government ..	200	P G ..	0820 to 1600	0.30	—
Jolo	Jolo Island 6° 02′ 40″ N. 120° 00′ 00″ E.	WVS	200	Government ..	600	P G ..	0700 to 1715	0.30	—
Malabang	Mindanao 7° 35′ 20″ N. 124° 04′ 10″ E.	WVI	200	Government ..	**600**, 1,200	P G ..	0700 to 1930	0.30	—
Malangas	—	KUXG	—	—	—	—	—	—	—
Malita	Davao 6° 22′ 00″ N. 125° 36′ 00″ E.	KDLP	—	Government ..	**600**, 1,200	—	—	—	—
Manila	Luzon 14° 35′ 48″ N. 120° 58′ 47″ E.	WVU	200	U.S. Army ..	600	O ..	—	—	—
Margosatubig ..	7° 31′ 15″ N. 123° 11′ 50″ E.	MG	150	Government ..	**600**, 900	P G ..	0715 to 1730	0.30	—
Olongapo	14° 49′ 26″ N. 120° 16′ 57″ E.	NPT	200	U.S. Navy ..	300, **600**	O ..	—	—	—
Port Lebak ..	Cotabato	KDMX	—	Government ..	—	—	—	—	—
Puerto Princesa ..	Paragua 9° 44′ 00″ N. 118° 42′ 40″ E.	WVV	150	Government ..	**600**, 1,200	P G ..	0700 to 1800	0.30	—
San José, Mindoro ..	12° 27′ 30″ N. 121° 03′ 00″ E.	WVY	200	Government ..	600	P G ..	0700 to 1815	0.30	—
S. Francisco, Philippine Islands	10° 38′ 00″ N. 124° 22′ 00″ E.	KDLR	—	Government ..	300, **600**	—	—	—	—
Zamboanga	Mindanao 6° 55′ 10″ N. 122° 02′ 19″ E.	WVW	400	Government ..	**600**, 1,200	P G ..	0700 to 1930	0.30	—
POLAND									
Cracow	—	—	—	—	800, 2,000	O ..	—	—	—
Posen	—	—	—	—	800, 2,000	O ..	—	—	—
Warsaw	—	WAR	—	—	800, 2,000	O ..	—	—	—

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
PORTO RICO										
Cavey	—	NZR	2,500	U.S. Navy ..	—	—[2]	—	—	—	[1] Operated by the United States Naval Communication Service Radio, Virginia [2] Transoceanic service [3] Meridian 75° west of Greenwich
Ensenada, Porto Rico	17° 59′ 00″ N. 66° 57′ 00″ W.	WPR	150	U.S. Navy ..	300, **600**, 1,800	P R ..	0500 to 1200 1300 to 2200 [3]	0.30	—	
San Juan, Porto Rico[1]	18° 28′ 04″ N. 66° 05′ 38″ W.	NAU	250	U.S. Navy ..	300, **600**, 5,250	P G ..	N	0.30	—	
PORTUGAL										
Lisbon (Cintra) ..	38° 47′ 11″ N. 9° 23′ 22″ W.	PQL	190	Government ..	300, 450, **600**	P G ..	N	0.40	—	[1] A direction finding service is carried out by this station when not engaged in official correspondence
Lisbon (Monsanto) ..	38° 44′ 00″ N. 9° 10′ 00″ W.	CTV	—	Navy	300, 450, **600**, 900, 1,200	O, D F[1]	—	—	—	
Porto (Leixões) ..	41° 10′ 35.7″ N. 8° 42′ 15.9″ W.	PQP	400	Government ..	300, **600**, 900, 1,200	P G ..	N	0.40	—	
PORTUGUESE EAST AFRICA										
Beira	34° 00′ 48″ E. 19° 50′ 16″ S.	CRT	200	Mozambique Company	**600**, 900, 1,000	P G ..	0800 to 2400	0.60	—	[1] Station operated by the Postal and Telegraphical administration of the district of Mozambique [2] Mean time of the meridian 30° east of Greenwich [3] The station transmits daily, at 1000 and 2100, time signals and information concerning the meteorological conditions, furnished by the Observatory of Campos Rodrigues (Lourenço Marques). (See International Time and Weather Signals)
Inhambane[1]	Province of Mozambique 23° 51′ 55″ S. 35° 22′ 50″ E.	CRY	300	Government ..	300, **600**	P G ..	0800 to 2400 [2]	0.60	—	
Lourenço Marques[1]	Province of Mozambique 25° 58′ 05″ S. 32° 35′ 39″ E.	CRZ	300	Government ..	300, **600**	P G[3] ..	N	0.60	—	
Mozambique[1] ..	Province of Mozambique 15° 01′ 47″ S. 40° 45′ 06″ E.	CRV	300	Government ..	300, **600**	P G ..	N	0.60	—	

PORTUGUESE GUINEA										[1]Under construction
Bissao [1]	11° 52′ 00″ N. 15° 37′ 00″ W.	—	—	Government ..	300, 600, 1,200, 1,600	—	—	—	—	
Bolama [1]	11° 35′ 00″ N. 15° 30′ 00″ W.	—	—	Government ..	300, 600, 900	—	—	—	—	
Caio [1]	11° 50′ 00″ N. 16° 24′ 00″ W.	—	—	Government ..	300, 600, 900	—	—	—	—	
ROUMANIA										[1] Public correspondence limited to the ships Dacia CVD, Imperatul Traian, Principesa Maria, Regele Carol I and Roumania [2] During the voyages of the Roumanian ships
Baneasa (Bucharest)	—	—	—	Government ..	—	P R [1] ..	N [2]	0.15	1.50	
Constantza-Tunnel ..	44° 10′ 32″ N. 28° 39′ 03″ E.	CVS	240	State Maritime Service	600	—	—	—	—	
Herastreu (Bucharest)	—	—	—	Government ..	—	—	—	—	—	
Vaslui (Moldavia) ..	—	—	—	Government ..	—	—	—	—	—	
RUSSIA										[1] The coast station charge is reduced to fr. 0.13 per word for correspondence with Russian ship stations [2] The station communicates only with Nicolaïewsk RNL [3] The station also communicates by radiotelegraphy with Kerbinskaïa [4] The station is only open during the season of navigation [5] For radiotelegrams exchanged between the stations Rade de Taganrog and Taganrog, there is an additional charge of fr. 0.40 per radiotelegram, plus fr. 0.025 per word [6] The station is reserved for the service of the Gulf of Riga [7] Two hours in advance of Greenwich time [8] Temporarily controlled by British Admiralty [9] Transmits press and a meteorological message
Anadyr	Behring Sea 64° 34′ 00″ N. 175° 35′ 00″ E.	RNR	130	—	300, 420, **600**	P G ..	Time of Petrograd [7] 1100 to 1900	0.60	—	
Arkhangel	Mouth of the Dwina 64° 32′ 00″ N. 40° 30′ 00″ E.	RQA	250	—	300, 420, **600**	P G ..	0800 to 1000 1200 to 1400 2000 to 2400	0.60 [1]	—	
Batoum	Black Sea 41° 36′ 00″ N. 41° 40′ 00″ E.	REI	—	—	—	O ..	—	—	—	
Fort d'Alexandrovsk	Coast of the Caspian Sea 44° 30′ 14″ N. 50° 16′ 40″ E.	RNF	160	—	300, 420, **600**	P G ..	0550 to 0950 1150 to 1550	0.60	—	
Kerbinskaïa	River Amgoun, a tributary of the Amur 52° 20′ 07.3″ N. 136° 29′ 18″ E.	RPN	170	—	—	— [3]	—	—	—	
Kerch	Crimea 45° 18′ 00″ N. 36° 27′ 00″ E.	REH	—	—	—	O ..	—	—	—	
Kronstadt	59° 59′ 00″ N. 29° 47′ 00″ E.	REA	—	—	360	O ..	—	—	—	
Mare-Sale	Kara Sea, Yalmal Peninsula 69° 42′ 59″ N. 66° 48′ 38″ E.	RTM	150	—	300, 420, **600**	P G ..	0800 to 1000 1200 to 1400 2000 to 2400	0.60 [1]	—	
Moscow	—	MSK	—	Government ..	5,000	—	—	—	—	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
RUSSIA—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Naïakhan	Sea of Okhotsk 61° 33′ 00″ N. 159° 59′ 00″ E.	RNN	130	—	300, 420, **600**	P G	1100 to 1900	0.60	—	
Nicolaïewsk RAU	On the Amur	RAU	—	—	—	O	—	—	—	
Nicolaïewsk RNL	Mouth of the Amur 53° 08′ 19.3″ N. 140° 42′ 54.4″ E.	RNL	240	—	300, **600**	P G[8]	N	0.60	—	
Odessa	—	RAR	—	—	—	O	—	—	—	
Okhotsk	Sea of Okhotsk 59° 22′ 00″ N. 143° 20′ 00″ E.	ROT	130	—	300, 420, **600**	P G	0500 to 2100	0.60	—	
Pétropavlovsk	Kamchatka 53° 00′ 10″ N. 158° 38′ 45″ E.	RPK	240	—	300, **600**	P G	N	0.60	—	
Petrograd (Tsarskoe-Selo)	—	TSR	—	Government	—	—	—	—	—	
Pétrowsk Daghestan	Coast of the Caspian Sea 42° 59′ 20″ N. 47° 30′ 00″ E.	ROK	160	—	300, 420, **600**	P G	0550 to 0950 1150 to 1550	0.60	—	
Prest	Aland Islands 60° 16′ 00″ N. 20° 21′ 00″ E.	REF	—	—	360	O	—	—	—	
Rade d'Astrakhan	Caspian Sea 45° 15′ 00″ N. 47° 25′ 00″ E.	RQT	110	—	300, 420, **600**	P G	0550 to 0950 1150 to 1550[4]	0.13	—	
Rade de Taganrog	Sea of Azov 46° 59′ 50″ N. 38° 14′ 10″ E.	ROE	110	—	300, 420, **600**	P G[5]	0600 to 2200	0.60[18]	—	
Reval	59° 20′ 00″ N. 24° 15′ 00″ E.	ROR	170	—	300, 420, **600**	P G	0600 to 2200	0.60	—	
Roüno	Gulf of Riga 57° 48′ 00″ N. 23° 15′ 40″ E.	RRN	70	—	300, 420, **600**	P G	0800 to 1200 1400 to 1700 2000 to 2100	0.60	—	
Sébastopol	44° 37′ 00″ N. 33° 33′ 00″ E.	REG	—	—	360	O	—	—	—	
Taganrog	Sea of Azov 47° 12′ 00″ N. 38° 48′ 00″ E.	RRT	170	—	300, 420, **600**	P G[5]	0600 to 2200	0.60[18]	—	

Vaigatch	Vaigats Island Kara Strait 70° 23′ 46″ N. 58° 48′ 00″ E.	RTV	150	—	300, 420, 600	P G ..	0800 to 1000 1200 to 1400 2000 to 2400	0.60 [1]	—	
Vladivostok	—	NPH	—	U.S. Navy ..	—	—	—	—	—	
Vladivostok RAS ..	43° 06′ 00″ N. 131° 54′ 00″ E.	RAS	—	—	1,200 approximately	O ..	—	—	—	
Vladivostok REJ ..	43° 06′ 49″ N. 131° 53′ 22″ E.	REJ	—	—	360	O ..	—	—	—	
Yougorski-Char ..	Kara Sea, Jugor Strait 69° 49′ 07″ N. 60° 45′ 42″ E.	RTU	150	—	300, 420, 600	P G ..	0800 to 1000 1200 to 1400 2000 to 2400	0.60 [1]	—	
SAINT HELENA										
St. Helena	15° 58′ 00″ S. 5° 45′ 00″ W.	BXH	—	Government ..	—	P G ..	—	0.60	—	
SAINT LUCIA (See **BRITISH WEST INDIES**)										
SAINT PIERRE and **MIQUELON ISLANDS**										
Galantry [1]	St. Pierre Is. 46° 46′ 00″ N. 56° 10′ 00″ W.	FIT	50	Government ..	600	P G ..	0800 to 1900	0.40	4.00	[1] The station also communicates with Miquelon [2] This station only communicates with Galantry
Miquelon [2]	Miquelon Is. 47° 07′ 00″ N. 56° 24′ 00″ W.	FIQ	80	Government ..	600	—	0800 to 1100 1500 to 1700	—	—	
SALVADOR										
Las Lomas de Candelaria	13° 43′ 47″ N. [1] 91° 21′ 27″ W.	—	—	Government ..	—	—	—	—	—	[1] Meridian of Paris
SAMOA ISLANDS										
Apia Radio	13° 51′ 00″ S. 171° 48′ 00″ W.	VMG	500	—	300, 600, 2,000	P G [1] ..	N	0.63	—	[1] The station is connected to the International telegraph system by wireless through Awanui Radio, New Zealand (Normal route or Suva), Fiji Islands (alternative route) [2] The station also communicates with fixed stations [3] Approximately
Tutuila	14° 15′ 00″ S. [3] 170° 45′ 00″ W.	NPU	250	U.S. Navy ..	300, 600	P G [2] ..	N	0.30	—	
SANDWICH IS. (See **HAWAIIAN ISLANDS**)										

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
SANTO DOMINGO	Meridian of Greenwich.						Local Time.	Francs.	Francs.	
La Romana	18° 25′ 00″ N. 68° 57′ 20″ W.	HIB	200-250	Guanica Centrale	300, **600**, 1,600	P G [1] ..	0800 to 1200 1400 to 1700	0.60 [2] 0.30 [3]	—	[1] La Romana and Santo Domingo also communicate with each other by wireless. Charge per word: fr. 0.40 without minimum. This charge is reduced to fr. 0.20 for telegrams sent on the service of the Santo Domingo Government [2] For ordinary radiotelegrams [3] For radiotelegrams sent on the service of the Santo Domingo Government [4] Public correspondence is also exchanged with Guantanamo Bay (Cuba) [5] East Tower positions. West Tower positions as follows: 18° 27′ 41.28″ N. 69° 53′ 18.09″ W.
Santo Domingo City	18° 25′ 00″ N.[5] 69° 53′ 00″ W.	NJG	200	U.S. Navy ..	300, **600**	P G [4] ..	N	0.30	—	
SARAWAK										[1] Under construction [2] The station sends out time signals at 0800 (local time) in the following manner: at 7 [58] the signal ▬ ● ▬ ● ▬ is sent three times followed by the word "time," at 7 [59] 50″ the word "time" is sent followed by five dashes at [illegible]
Bintulu [1]	—	—	—	—	—	—	—	—	—	
Goebilt	111° 27′ 30″ E. 1° 37′ 50″ N.	VSD	80	Sarawak Government	**600**	P G [2] ..	0800 to 1100 1300 to 1600	0.40	1.00	
Kuching	1° 33′ 20″ N. 110° 20′ 35″ E.	VQF	500	—	600, 1,000 1,500, **1,800**	P G ..	0800 to 1800	0.40	2.00	
Miri	4° 26′ 00″ N. 114° 01′ 00″ E.	VQP	300	—	600, **1,800**	P G ..	0800 to 1800	0.40	2.00	
Sadong, Sarawak ..	1° 21′ 10″ N. 110° 45′ 10″ E.	VQW	150	—	**600**	P G ..	0800 to 1100 [illegible]	0.40	2.00	
[illegible]	[illegible]	[illegible]								

SEYCHELLES										
Seychelles	Mahé 4° 00′ 00″ S. 55° 10′ 00″ E.	BZH	500	British Admiralty	600-2,000 (spark) 4,000 (arc)	P R ..	N	0.60	--	
SIAM										
Bangkok	13° 43′ 36.35″ N. 100° 33′ 02.08″ E.	HGA	Day 300 Night 600	Government ..	300, 600 1,600, 1,800	—[1]	—	0.40	4.00	[1] The station is open for official correspondence. However, it accepts messages concerning the movements and security of ships exchanged between the captain of the ships and their owners or agents
Singora (Songkhlâ) ..	Gulf of Siam, Malay Peninsula 7° 13′ 05.11″ N. 100° 32′ 31.79″ E.	HGB	Day 300 Night 600	Government ..	300, 600 1,600, 1,800	—[1]	—	0.40	4.00	
SIERRA LEONE										
Sierra Leone.. ..	8° 29′ 48″ N. 13° 13′ 55″ W.	VPU	250	African Direct Telegraph Co., Ltd.	300, 600	P G ..	0700 to 2100 Sundays, 0800 to 1000 1600 to 1800	0.60	—	
SINGAPORE (See **MALAY PENINSULA**)										
SOLOMON ISLANDS										
Kieta Radio ..	Bougainville Island 6° 12′ 15″ S. 155° 39′ 36″ E.	VIU	200	Australian Government	300, 600	P G[1] ..	0600 to 0700 0900 to 1000 1300 to 1400 1700 to 2000	0.30[4] 0.60[5]	—	[1] The station is connected to the International Telegraph System by wireless through Woodlark Island and Townsville Radio [2] Mean time of the meridian, 142° 30′ E. of Greenwich [3] And until traffic is cleared [4] For radiotelegrams to and from ships licensed by the Commonwealth of Australia and New Zealand Administrations [5] For radiotelegrams to and from ships licensed by other Administrations
Tulagi	Florida Island 9° 06′ 40° S. 160° 09′ 40″ E.	VQJ	Day 400 Night 1,300	Australian Government	600, 1,800, 2,500	P G[1] ..	Local time[2], 1900 to 2400	0.30[4] 0.60[5]	—	
SOUTH AFRICA (**Union of**)										
Capetown Radio ..	34° 08′ 45.90″ S. 18° 19′ 17.51″ E.	VNC	350	Government ..	300, 600	P G[1 2]	N	0.60	—	[1] The station transmits each day, at 1 p.m., a report in plain language containing information concerning the meteoro-
Dassen Island ..	18° 53° 00″ E. 33° 26′ 00″ S.	VNF	45	—	600	—[2]	X	—	—	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	
SOUTH AFRICA (Union of)—*cont'd.*										
Durban Radio ..	29° 49′ 07″ S. 31° 01′ 17″ E.	VND	250	Government ..	300, **600**	P G [1] ..	N	0.60	—	logical conditions prevailing on the whole coast of the Union of South Africa
Durban (Jacobs) ..	29° 53′ 00″ S. 31° 04′ 00″ E.	BZI	1,000	British Admiralty	600-2,000 (spark) 4,009 (arc)	O ..	—	—	—	[2] The station transmits a time signal each day. (See International Time and Weather Signals)
Port Elizabeth Radio	25° 37′ 00″ E. 33° 57′ 40″ S.	VNQ	Day 300 Night 1,000	Government ..	300, **600**, 1,200	P G ..	N	0.60	—	
Port Nolloth ..	29° 14′ 00″ S. 16° 52′ 00″ E.	BZJ	1,000	British Admiralty	600-2,000 (spark) 4,000 (arc)	O ..	—	—	—	[3] The station only corresponds with fixed stations
SPAIN										
Almeria	36° 51′ 00″ N. 2° 31′ 15″ W.	EGA	220	Army	600, **900**	O ..	N	—	—	[1] Opened provisionally
Aranjuez	40° 01′ 48″ N. 3° 04′ 32″ W.	EAA	430	Compania Nacional de T.S.H.	300, **600**, 2,130	P G [4] ..	N	0.45	4.50	[2] Under construction
Barcelona EAB ..	41° 18′ 42″ N. 2° 06′ 28″ E.	EAB	430	Compania Nacional de T.S.H.	300, **600**, 2,300	P G ..	N	0.45	4.50	[3] The station transmits only correspondence of the Compania Trasatlantica
Barcelona EGE ..	41° 23′ 08″ N. 2° 03′ 52″ E.	EGE	430	Army	600, 1,000, 1,600	O ..	N	—	—	[4] High-power interior station open for transcontinental public correspondence
Bilbao	43° 23′ 53″ N. 2° 55′ 34″ W.	EGH	320	Army	600, 1,200, 1,600	O ..	N	—	—	
Cabo de Palos ..	Murcia 37° 38′ 00″ N. 0° 40′ 00″ W.	EAP	200	Compania Nacional de T.S.H.	300, **600**, 1,800	P G ..	N	0.45	4.50	
Cabo Finisterre [1] ..	42° 52′ 40″ N. 9° 16′ 18″ W.	EAF	210	Compania Nacional de T.S.H.	300, **600**, 1,800	P G ..	N	0.45	4.50	
Cabo Mayor ..	Santander 43° 30′ 00″ N. 3° 48′ 30″ E.	EAS	108	Compania Nacional de T.S.H.	300, **600**, 1,800	P G ..	N	0.45	4.50	
Cadiz EAC	36° 29′ 45″ N. 6° 16′ 14″ W.	EAC	860	Compania Nacional de T.S.H.	300, **600**, 2,540	P G ..	N	0.45	4.50	
Cadiz	36° 31′ 30″ N. 6° 17′ 42″ W.	—	6	—	70	P [2] ..	—	—	—	
Cartagena	37° 35′ 36″ N. 0° 59′ 18″ W.	EBX	210	Navy	600, 900, 1,000, 1,200, 1,600	O ..	N	—	—	
Coruña	43° 24′ 29″ N. 8° 24′ 13″ W.	EGJ	430	Army	600, 1,200, 1,600	O ..	N	—	—	

Guadalajara	40° 37′ 54″ N. 3° 10′ 09″ W.	EGZ	54	Army	900	O ..	X	—	—	
Huelva	—	—	—	Compania Nacional de T.S.H.	—	—	—	—	—	
La Carraca	Gulf of Cadiz 36° 29′ 30″ N. 6° 10′ 50″ W.	CLZ	60	Navy	300, 600, 1,200	O ..	N	—	—	
Le Ferrol [3]	43° 28′ 52″ N. 8° 14′ 05″ W.	EBW	440	Navy	600, 900, 1,200, 1,600, 1,800	O ..	N	—	—	
Madrid EBZ.. ..	40° 25′ 00″ N. 3° 43′ 00″ W.	EBZ	15	Navy	225, 300	O ..	N	—	—	
Madrid EGC.. ..	40° 24′ 30″ N. 3° 50′ 30″ W.	EGC	540	Army	600, 900, 1,600, 2,000, 2,500	O ..	N	—	—	
Mahon	Minorca 39° 52′ 29″ N. 4° 22′ 39″ E.	EGI	320	Army	600, 1,200, 1,600	O ..	N	—	—	
Malaga	36° 43′ 00″ N. 4° 24′ 00″ W.	EGM	—	Compania Nacional de T.S.H.	—	—	—	—	—	
Matagorda	Gulf of Cadiz 36° 31′ 30″ N. 6° 14′ 54″ W.	—	6	—	70	P [3] ..	—	—	—	
San Fernando Cadiz	—	EBY	—	—	—	O ..	N	—	—	
Soller	Majorca 39° 45′ 15″ N. 2° 45′ 40″ E.	EAO	270	Compania Nacional de T.S.H.	300, 600	P G ..	N	0.45	4.50	
Valencia	39° 27′ 10″ N. 0° 22′ 46″ W.	EGG	320	Army	600, 1,200, 1,600	O ..	N	—	—	
Vigo	42° 15′ 00″ N. 8° 40′ 00″ W.	EAV	430	Compania Nacional de T.S.H.	300, 600, 2,900	P G ..	N	0.45	4.50	
SPITZBERGEN										
Spitzbergen	Green Harbour 78° 02′ 26″ N. 14° 14′ 27″ E.	LFG	400	Norwegian Government	300, 600	P G ..	Central European Time. N [1] 0800 to 2100 [2]	0.40	4.00	[1] From June 15th to September 30th [2] From October 1st to June 14th
Calypso Bay.. ..	—	—	—	Northern Exploration Co.	600, 800, 1,000	P ..	—	—	—	
ST. MARTIN ISLAND, W.I.										
Philipsburg	St. Martin Isl.	—	—	—	—	—	—	—	—	
STRAITS SETTLEMENTS (See **MALAY PENINSULA**)										
SUDAN										
Atbara	17° 41′ 15″ N. 33° 58′ 43″ E.	ATR	150	Sudan Government	600	P G ..	—	—	—	[1] Approximately [2] In the case of messages originating at or intended for Port Sudan, the local land line charge is included in the coast tax [3] Fitted with valve receiver
El Fasher	13° 37′ 33″ N. 25° 21′ 11″ E.	FSR	200	Sudan Government	900	P G ..	Week days: 0600 to 1300 Fridays and Holidays: 0900 to 1100	—	—	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge Per Word.	Coast Charge Minimum Charge.	Remarks.
SUDAN —*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Kebkebia	13° 39′ 0″ N.[1] 24° 5′ 0″ E.[1]	ZNR	200	Sudan Government	900	P G ..	Week days: 0600 to 1300 Fridays and Holidays: 0900 to 1100	—	—	
Kereinik	13° 22′ 0″ N.[1] 22° 46′ 0″ E.[1]	KER	200	Sudan Government	900	P G ..	Do.	—	—	
Khartoum KMR ..	15° 36′ 32″ N. 32° 31′ 3″ E.	KMR	250	Sudan Government	700	—	Do.	—	—	
Khartoum SUK ..	15° 36′ 32″ N. 32° 31′ 3″ E.	SUK	1,500	Sudan Government	1,000 3,000 (C.W.)	P G ..	—	—	—	
Malakal	9° 33′ 0″ N. 31° 39′ 0″ E.	MLR	250	Sudan Government	700	P G ..	Week days: 0600 to 1300 Fridays and Holidays: 0900 to 1100	—	—	
Mongalla	5° 11′ 34″ N. 31° 45′ 56″ E.	MGR	250	Sudan Government	700	P G ..	Do.	—	—	
Nasser	8° 35′ 30″ N. 33° 3′ 30″ E.	NSR	250	Sudan Government	700	P G ..	Do.	—	—	
Port Sudan Radio ..	19° 37′ 05″ N. 37° 12′ 55″ E.	SUD	250	Sudan Government	300, **600**	P G ..	0700 to 1300 1700 to 2300	0.60[2]	—	
Wau	7° 41′ 58″ N. 28° 0′ 36″ E.	WWR	250	Sudan Government	700	P G ..	Week days: 0600 to 1300 Fridays and Holidays: 0900 to 1100	—	—	
SWAN ISLAND										
Swan Island ..	—	US	—	United Fruit Co..	—	—[1]	—	—	—	[1] Acts as a relay station for Belize, British Honduras, for traffic intended for United States and United Kingdom
SWEDEN										
Boden	65° 50 40′ N. 21° 38′ 50″ E.	SAI	200	State Telegraphs	300, **600**	P G ..	N[1]	0.40	4.00	[1] The station is closed, when by reason of ice, navigation is suspended in the Gulf of Bothnia
Gothenburg (Göteborg)	57° 40′ 44″ N. 11° 54′ 00″ E.	SAB	350	State Telegraphs	300, **600**	P G ..	N[1]	0.40	4.00	[2] The station is intended for the transmission to the

Gotland	Gothland 57° 43′ 47″ N. 18° 35′ 50″ E.	SAE	410	Marine Dept. ..	300, 600	P G ..	N	0.40	4.00
Grundkallen Bateau-phare	60° 29′ 50″ N. 18° 54′ 30″ E.	SAK	55	—	300, 450, 600	Special [6]	X	— [7]	— [7]
Härnösand	62° 44′ 17″ N. 18° 07′ 47″ E.	SAH	350	State Telegraphs	300, 600	P G ..	N [1]	0.40	4.00
Karlsborg (Stockholm)	—	SAJ	—	—	4,000 (c.w.)	—	0850, 1930	—	—
Karlskrona	56° 09′ 09″ N. 15° 35′ 23″ E.	SAA	420	Marine Dept. ..	300, 600	P G ..	N	0.40	4.00
Ölandsrev (Lightship)	Near the extreme south of Öland 56° 07′ 00″ N. 16° 34′ 00″ E.	SAG	55	—	300, 450, 600	— [2]	X	— [3]	— [3]
Trälleborg	55° 22′ 13″ N. 13° 09′ 46″ E.	SAC	250	State Railways ..	300, 875, 600	P R[4], O[5]	N	0.40	4.00
Vaxholm	59° 24′ 15″ N. 18° 21′ 50″ E.	SAF	350	State Telegraphs	300, 600	P G ..	N	0.40	4.00
Vinga..	57° 38′ 00″ N. 11° 36′ 10″ E.	SAL	—	—	600 [1]	D F ..	—	—	—
TAHITI (See **FRENCH OCEANIA**)									
TIMOR (Portuguese)									
Dili	125° 35′ 40″ E. 9° 32′ 00″ S.	CRE	500	Administration radiotelegraphique des Colonies Portugaises	200, 600	P G ..	Week days and Holidays: 0700 to 0800, 1330 to 1900 Sundays: 1330 to 1900	0.60	—
TOBAGO (See **BRITISH WEST INDIES**)									

Karlskrona coast station of telegrams received by means of flag signals from ships passing within sight or the retransmission by means of these signals, to such ships, of telegrams sent to it through the Karlskrona coast station

[3] Telegrams originating on or intended for ships and forwarded through Karlskrona are subject to the coast charge of Karlskrona, the charge for transmission over the inland telegraph lines and a fixed charge of fr. 1 per radiotelegram

[4] Public correspondence with the ferry boats of the Sassnitz-Trälleborg Line

[5] Official correspondence with Sassnitz and with the ferry boats of the Sassnitz-Trälleborg Railway Line, concerning the railway traffic

[6] The station is intended for the transmission to the Härnösand coast station of telegrams received by means of flag signals from ships passing within sight, or the retransmission by means of these signals, to such ships, of telegrams sent to it through the Härnösand coast station

[7] Telegrams originating on or intended for ships and forwarded through Härnösand are subject to the coast charge of Härnösand, the charge for transmission over the inland telegraph lines, and a fixed charge of fr. 1 per telegram

If, exceptionally, a telegram intended for a ship at sea is transmitted by

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
	Meridian of Greenwich.							Francs.	Francs.	radiotelegraphy to that ship by the lightship, no charge will be credited to the ship station
TONGA ISLANDS										
Nukualofa Radio ..	21° 07′ 57.5″ S. 175° 12′ 06″ W.	VSB	520	Government ..	300, 600, 1,200, 1,600	P G[1] ..	1000 to 1500	0.60	—	[1] Meteorological information free on request
TONQIN (See **FRENCH INDO-CHINA**)										
TRINIDAD (See **BRITISH WEST INDIES**)										
TRIPOLI										
Tripoli Radio ..	32° 52′ 40″ N. 13° 11′ 40″ E.	ICK	160 300	Government ..	300, **600**	P G ..	N	0.60	—	
TUNIS							Central European Time.[1]			[1] One hour in advance of Greenwich time
Ben-Negro-Gonio[4] ..	37° 15′ 00″ N. 9° 53′ 30″ E.	FUA[3]	—	French Navy ..	450	D F ..	N	—	—	[2] The coast charge is reduced to fr. 0.15 per word for correspondence with ships engaged in a regular service between France on the one hand, and Corsica, Algeria, and Tunis on the other
Bizerte	In Sidi Abdallah 37° 16′ 00″ N. 9° 49′ 00″ E.	FUA	—	French Navy ..	—	O ..	0900 to 2400	—	—	
Cap-Bon	37° 04′ 48″ N. 11° 02′ 23″ E.	FFT	100	French Navy	300, **600**	P G ..	0700 to 2200	0.40[2]	—	[3] Works in connection with Bizerte
TURKEY										
Constantinople (Ok Meiddan)	41° 02′ 00″ N. 28° 58′ 00″ E.	—	—	—	600, 2,000	—	—	—	—	[4] A charge of fr. 6 will be made for each bearing. The French State accepts no responsibility on account of the radio compass work
Constantinople—Osmanieh	—	OSM	—	—	5,500 (c.w.)	—	0230, 0830 (G.M.T.)	—	—	
UNITED KINGDOM										
Aberdeen . ..	57° 11′ 29.9″ N. 2° 11′ 13″ W.	BYD	—	Admiralty ..	—	O ..		—	—	[1] Independent direction finding station [2] Special correspondence, including official and

Admiralty	51° 30′ 00″ N. 0° 10′ 00″ W.	BYA	—	Admiralty ..	—	O ..	—	—	—
Air Ministry, London	51° 30′ 40″ N. 0° 07′ 10′ W.	GFA	500	Air Ministry ..	1,400[32], 1680[32] (c.w.)	O ..	N	—	—
Andover, Hants ..	51° 12′ 30″ N. 1° 32′ 30″ W.	GFI	—	—	(c.w.)	O ..	—	—	—
Baldonnel	53° 21′ 00″ N. 6° 29′ 00″ W.	GFB	—	—	(c.w.)	O ..	—	—	—
Ballybunion ..	Ireland, Co. Kerry	YXQ	—	—	—	P ..	—	—	—
Ballycastle Radio ..	Ireland, North Channel 55° 11′ 00″ N. 6° 12′ 00″ W.	GSL	15	Post Office ..	250	—[2]	0825 to 2025	—	—
Berwick, D F [1 3] ..	55° 41′ 46.7″ N. 1° 53′ 41.7″ W.	BVG	—	Admiralty ..	450	D F [1] ..	—	—	—
Broomfield, Essex ..	51° 45′ 00″ N. 0° 28′ 00″ E.	MAX	—	Marconi Co. ..	—	—[23]	—	—	—
Bunbeg	North-west Coast of Ireland 55° 04′ 00″ N. 8° 09′ 00″ W.	BYR	200	Admiralty ..	220, 300, 600, **1,000**, 1,200	O ..	N	—	—
Butt of Lewis ..	6° 14′ 00″ W. 58° 32′ 00″ N.	—	—	Lloyd's	—	P ..	—	—	—
Caistor-on-Sea Radio	Near Yarmouth 52° 38′ 47″ N. 1° 43′ 51″ E.	GCS	—	Post Office ..	1,000	—[23]	—	—	—
Calshot	1° 19′ 00″ W. 50° 49′ 00″ N.	GFL	—	—	(c.w.)	O ..	—	—	—
Carnarvon Radio ..	53° 07′ 00″ N. 4° 11′ 00″ W.	MUU	—	Marconi Co. ..	14,500	—[24]	N	—	—
Carnsore, D F [1] ..	52° 11′ 50.7″ N. 6° 21′ 00″ W.	BVZ	—	Admiralty ..	450	D F [2] ..	—	—	—
Castle Bromwich Radio	52° 30′ 00″ N. 1° 50′ 00″ W.	GEC	400	Civil Aviation ..	900 (c.w.)	—	Sunrise to sunset	—	—
Cattewater	50° 25′ 00″ N. 4° 05′ 00″ W.	GFM	—	—	(c.w.)	O ..	—	—	—
Chelmsford	51° 43′ 45″ N. 0° 28′ 38″ E.	MZX	—	Marconi Co. ..	—	—[23]	—	—	—
Cleethorpes	South-east of Grimsby 53° 31′ 44.4″ N. 0° 03′ 17.6″ W.	BYB	—	Admiralty ..	3,000	O ..	—	—	—
Clifden Radio ..	West Coast of Ireland 53° 27′ 00″ N. 10° 01′ 00″ W.	MFT	—	Marconi Co. ..	6,500	—[25]	—	—	—
Corkbeg	Entrance to the Port of Cork 51° 48′ 56·1″ N. 8° 15′ 20″ W.	BYQ	—	Admiralty ..	**600**, 800	O ..	—	—	—
Cranwell	53° 03′ 00″ N. 0° 30′ 00″ W.	GFC	—	—	(c.w.)	O ..	—	—	—
Cromarty	Black Isle 57° 41′ 45″ N. 4° 01′ 30″ W.	BYP	—	Admiralty ..	—	O ..	—	—	—

ordinary telegrams exchanged with Rathlin Island

[3] Peterhead, Berwick and Flamborough direction finding stations are linked together by special landline, enabling any one to control the other two if required

[4] At the present the handling of public correspondence has been suspended

[5] This coast tax applies to messages exchanged with all ships except those engaged on short voyages and where special arrangements have been made with the Postmaster-General for a reduced coast tax. (See notes 6 and 7.) In the case of telegrams originating in or intended for the United Kingdom the combined coast and landline charge is fr. 0.73 per word

[6] This coast tax applies to messages exchanged with certain vessels making regular voyages of more than 200 miles, but not exceeding 1,000 miles and where special arrangements have been made with the Postmaster General for the application of such tax. In the case of radiotelegrams originating in or intended for the United Kingdom, the combined coast and land line charge is fr. 0.44 per word with a minimum of fr. 4.40 per radiotelegram

[7] This coast tax applies to messages exchanged with certain ships making regular voyages of 200 miles or less, and where special arrangements have been made with the Postmaster-General for the application of such tax.

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.
	Meridian of Greenwich.							Francs.	Francs.
UNITED KINGDOM —*contd.*									
Crookhaven	South Coast of Ireland 51° 27′ 00″ N. 9° 46′ 00″ W.	GXO	250	Post Office . ..	300	—[10]	—	—	—
Cross Sand Lightship	North-east of Yarmouth 52° 38′ 00″ N. 1° 54′ 00″ E.	GVA	15	Trinity House ..	230	—[8]	N	—[9]	—
Croydon Radio ..	51° 20′ 30″ N. 0° 07′ 00″ W.	GED	400	Civil Aviation ..	900 (c.w.)	—[10]	Sunrise to sunset	—	—
Cullercoats Radio ..	Near Tynemouth 55° 02′ 15.6″N. 1° 25′ 40.5″ W.	GCC	250	Post Office ..	300, **600**	P G ..	N	0.60 [5] 0.33 [6] 0.17 [7]	— 3.30 [6] 1.70 [7]
Culver Cliff	Isle of Wight 50° 39′ 58.4″ N. 1° 06′ 07.8″ W.	BYM	200	Admiralty ..	220, 600, 800, **1,000**	O ..	—	—	—
Devizes Radio ..	1° 57′ 10.7″ W. 51° 23′ 49.7″ N.	GKU	1,000	Post Office ..	1,800, **2,100**, 3,000 (c.w.)	P G ..	N	0.60 [5]	—
Didsbury, Lancs. ..	53° 23′ 00″ N. 2° 17′ 00″ W.	GEM	400	Civil Aviation ..	900 (c.w.)	—	Sunrise to sunset	—	—
Donibristle	56° 02′ 35″ N. 3° 21′ 05″ W.	GFK	250	—	1,300 (c.w.)	O ..	N	—	—
Dover	51° 07′ 00″ N. 1° 18′ 00″ E.	BYL	—	Admiralty ..	—	O ..	—	—	—
East Goodwin Lightship	Straits of Dover 51° 13′ 00″ N. 1° 36′ 00″ E.	GVB	15	Trinity House	230	—[8]	N	—[9]	—
Fastnet	51° 23′ 00″ N. 9° 36′ 00″ W.	GNJ	100	Lloyd's	**800**	P [16] ..	—	—	—
Felixstowe	Near Harwich 51° 57′ 00″ N. 1° 20′ 00″ E.	BYJ	—	Admiralty ..	—	O ..	—	—	—
Felixstowe	51° 57′ 00″ N. 1° 20′ 00″ E.	GFF	—	—	(c.w.)	O ..	—	—	—
Fishguard Radio ..	Pembrokeshire 52° 00′ 44.5″ N. 4° 59′ 19.5″ W.	GRL	200	Post Office ..	300 **600**	P G ..	N	0.60 [5] 0.33 [6] 0.17 [7]	— 3.30 [6] 1.70 [7]
Flamborough D F ..	54° 06′ 49.7″ N. 0° 04′ 56.3″ W.	BVN	—	Admiralty ..	450	D F [1] ..	—	—	—
Flannan Islands ..	58° 17′ 00″ N. 7° 33′ 00″ W.	—	—	Lloyd's	—	P [14] ..	—	—	—

Remarks

In the case of messages originating in or intended for the United Kingdom, the combined coast and land line charge is fr. 0.28 per word, with a minimum of fr. 2.80 per radiotelegram

[8] Reception and transmission of distress signals

[9] A fixed charge is made of fr. 1 per radiotelegram in addition to the ordinary telegraph charges

[10] Correspondence restricted to messages exchanged with the steamers of the South Eastern and Chatham Railway Company

[11] Correspondence restricted to ships of the Midland Railway Company

[12] During the passage of the steamers between Heysham and Belfast

[13] The wavelength of 600 metres is used solely for communication with Scheveningen-Port. Such communication takes place only in the case of urgent need

[14] Communication restricted to the ships of the Great Eastern Railway Company

[illegible]

Folkestone Harbour Radio	Straits of Dover 51° 04′ 38″ N. 1° 11′ 27″ E.	GUR	45	South Eastern and Chatham Railway	800, 600	P G ..	—		
Grain..	51° 27′ 10″ N. 0° 43′ 15″ E.	GFG	100	—	1,300 (c.w.)	O ..	N	—	—
Grimsby Radio ..	53° 53′ 07″ N. 0° 04′ 05.7″ W.	BYV	100	Post Office ..	300, **600**	P G [20] ..	N	0.60 0.33 [6] 0.17 [7]	— 3.30 [6] 1.70 [7]
Guernsey Radio ..	Channel Islands 49° 27′ 10″ N. 2° 31′ 50″ W.	GKA	—	Post Office ..	—	— [30]	—	—	—
Gull Lightship ..	51° 16′ 00″ N. 1° 28′ 00″ E.	GVC	15	Trinity House ..	230	— [8]	N	— [9]	—
Harwich BVH ..	51° 57′ 00″ N. 1° 15′ 00″ E.	BVH	—	Admiralty ..	—	O ..	—	—	—
Harwich BWH ..	51° 57′ 00″ N. 1° 15′ 00″ E.	BWH	—	Admiralty ..	—	O ..	—	—	—
Heysham Harbour Radio	Morecambe Bay 54° 02′ 00″ N. 2° 55′ 00″ W.	GKG	150	Midland Railway	400	P [11] ..	N [12]	—	—
Horsea	Near Portsmouth 50° 50′ 15″ N. 1° 06′ 10″ W.	BYC	—	Admiralty ..	3,000, 4,500	O ..	—	—	—
Howden	53° 47′ 00″ N. 0° 53′ 00″ W.	GFZ	—	—	(c.w.)	O ..	—	—	—
Immingham ..	53° 37′ 00″ N. 0° 11′ 00″ W.	BZU	—	Admiralty ..	—	O ..	—	—	—
Inchkeith	Firth of Forth 56° 01′ 59″ N. 3° 08′ 04″ W.	BZA	—	Admiralty .	600	O .	—	—	—
Ipswich	52° 03′ 18.8″ N. 1° 08′ 28.2″ E.	BYE	—	Admiralty .	—	O ..	—	—	—
Isle of Man Radio [29 30]	54° 09′ 00″ N. 4° 30′ 00″ W.	GDX	—	—	—	—	—	—	—
Kingsnorth	51° 25′ 00″ N. 0° 36′ 00″ E.	BZS	—	Admiralty .	—	O ..	—	—	—
Kingstown	53° 17′ 49″ N. 6° 08′ 20″ W.	BWK	—	Admiralty ..	—	O .	—	—	—
Land's End Radio ..	West Coast of Cornwall 50° 07′ 03.8″ N. 5° 40′ 05″ W.	GLD	250	Post Office ..	300, **600**	P G ..	N	0.60 [5] 0.33 [6] 0.17 [7]	— 3.30 [6] 1.70 [7]
Leafield	51° 50′ 14″ N. 1° 33′ 42″ W.	—	—	Marconi Co. ..	—	P ..	—	—	—
Lee-on-Solent [33] ..	50° 48′ 30″ N. 1° 12′ 30″ W.	GFW	—	—	(c.w.)	O ..	—	—	—
Lerwick Radio ..	Shetland Islands 1° 11′ 00″ W. 60° 09′ 00″ N.	GEL	250	—	600, **900**, 1,400	C .	—	—	—
Lizard, D F [1] ..	49° 59′ 06.3″ N. 5° 12′ 24.1″ W.	BVY	—	Admiralty ..	450	D F [1] ..	—	—	—
Lochboisdale Radio	Hebrides 57° 08′ 00″ N. 7° 16′ 00″ W.	GCB	150	Post Office ..	300	O [30] ..	0800 to 2000 Weekdays only	—	—
Lympne Radio ..	51° 05′ 00″ N. 1° 00′ 00″ E.	GEG	400	Civil Aviation ..	900 (c.w.)	—	From sunrise to sunset	—	—

when out of range of any other British coast station: weather report transmitted at 0930 and 2130

[17] Special correspondence, including official and ordinary telegrams exchanged with Ballycastle, Antrim

[18] Dependent direction finding station controlled by Amlwch

[19] Dependent direction finding station controlled by Malin Head

[20] Transmitting station for Seaview direction finding station

[21] Transmitting station for Rhyl direction finding station

[22] Special correspondence, including official and ordinary correspondence exchanged with Lochboisdale

[23] Experimental station

[24] Transocean service

[25] Transatlantic service communicates with Glace Bay (Nova Scotia)

[26] For signal duty

[27] Transatlantic receiving station only

[28] Transocean receiving station

[29] Communicates only with fixed stations

[30] Station temporarily closed

[31] Station used only in emergency

[32] The station sends out meteorological synoptic messages and general inferences on a wavelength of 1,400 metres at 2.05 a.m., 8.05 a.m., 9.15 a.m., 2.05 p.m., 7.05 p.m. and 8 p.m. (Greenwich mean time), and sends weather messages on a wavelength of 1,680 metres at 7.35 a.m., 8.35 a.m., 9.35 a.m., 10.35 a.m., 11.35 a.m., 12.35 p.m.

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
UNITED KINGDOM *contd.*—	Meridian of Greenwich.							Francs.	Francs.	
Malin Head Radio [20]	North Coast of Ireland 55° 21′ 45″ N. 7° 20′ 30″ W.	GMH	250	Post Office ..	300, **600**	P G ..	N	0.60 [5] 0.33 [6] 0.17 [7]	— 3.30 [6] 1.70 [7]	1.35 p.m., 2.35 p.m., 3.35 p.m. and 4.35 p.m. (Greenwich mean time). [23] Under construction
Marconi House ..	London 51° 30′ 40″ N. 0° 07′ 10″ W.	—	—	Marconi Co. ..	—	P ..	—	—	—	
Newhaven Radio ..	50° 48′ 09″ N. 0° 03′ 30″ E.	GNV	120	London, Brighton and S.C. Railway	400	O ..	1000 to 1400 2030 to 2330	—	—	
Niton Radio ..	Isle of Wight 50° 34′ 41.8″ N. 1° 17′ 00″ W.	GNI	150	Post Office ..	300, **600**	P G ..	N	0.60 [5] 0.33 [6] 0.17 [7]	— 3.30 [6] 1.70 [7]	
North Foreland Radio	North of Ramsgate 51° 22′ 29″ N. 1° 26′ 51″ E.	GNF	150	Post Office ..	300, **600**	P G ..	N	0.60 [5] 0.33 [6] 0.17 [7]	— 3.30 [6] 1.70 [7]	
Orfordness D F ..	1° 32′ 56″ E. 52° 05′ 46″ N.	BXH	—	—	—	D F ..	—	—	—	
Parkeston Quay Radio	Near Harwich 51° 56′ 58″ N. 1° 15′ 12″ E.	GPQ	130	Great Eastern Railway	**450**, 600 [15]	P [14] ..	N [15]	—	—	
Pembroke	51° 41′ 30″ N. 4° 57′ 31.7″ W.	BYF	—	Admiralty ..	—	O ..	—	—	—	
Poldhu Radio ..	Extreme South-west of England 50° 01′ 41″ N. 5° 15′ 43.4″ W.	MPD	1,500	Marconi Co. ..	2,800	P R [16] ..	0100 to 0400	3.00	—	
Poole (The Haven) ..	50° 40′ 00″ N. 1° 56′ 00″ W.	MHH	—	Marconi Co. ..	—	— [23]	—	—	—	
Portland Bill ..	English Channel 50° 31′ 13.8″ N. 2° 27′ 17.6″ W.	BYN	—	Admiralty ..	600, 800	O [20] ..	—	—	—	
Portpatrick Radio ..	Scotland, North Channel 54° 50′ 37.7″ N. 5° 07′ 23.8″ W.	BYS	—	Post Office ..	300, **600**	P G [20] ..	N	0.60 [5] 0.33 [6] 0.17 [7]	— 3.30 [6] 1.70 [7]	
Portsmouth Signal School	50° 48′ 00″ N. 1° 06′ 00″ W.	BZC	—	Admiralty ..	—	O ..	—	—	—	
Pulham	1° 13′ 00″ E. 52° 24′ 30″ N.	GEP	400	Civil Aviation ..	900	Civil Aviation	From sunrise to sunset	—	—	

Queenstown ..	[illegible] 51° 51′ 04″ N.	[illegible]	[illegible]	—	[illegible] 1,000	[illegible]			
Rame Head ..	Entrance to the Port of Plymouth 50° 18′ 59.3″ N. 4° 13′ 06.9″ W.	BYO	—	Admiralty ..	600, 800	O ..	—	—	—
Rathlin Island Radio	North Channel 55° 17′ 00″ N. 6° 10′ 00″ W.	GRN	15	Post Office ..	250	—[17]	0825 to 2025	—	—
Renfrew Radio ..	55° 51′ 00″ N. 4° 23′ 30″ W.	GER	400	Civil Aviation ..	900 (c.w.)	—	From sunrise to sunset	—	—
Rosyth	To the West of Edinburgh 56° 01′ 42″ N. 3° 24′ 43.9″ W.	BYH	—	Admiralty ..	—	O ..	—	—	—
Seaforth Radio ..	Liverpool 53° 28′ 06.7″ N. 3° 00′ 42″ W.	GLV	150	Post Office ..	300, 600	P G ..	N	0.60 [5] 0.33 [6] 0.17 [7]	— 3.30 [6] 1.70 [7]
Sheerness	Mouth of the Thames 51° 26′ 45″ N. 0° 44′ 46″ E.	BYK	—	Admiralty ..	—	O ..	—	—	—
Shotwick	53° 14′ 00″ N. 2° 59′ 00″ W.	GFO	—	—	(c.w.)	O ..	—	—	—
South Goodwin Lightship	Straits of Dover 51° 09′ 00″ N. 1° 28′ 00″ E.	GVD	15	Trinity House ..	230	—[8]	N	—[9]	—
Stonehaven Radio ..	To the South of Aberdeen 56° 56′ 21.8″ N. 2° 16′ 49.2″ W.	GSW	900, 250	Post Office ..	300, 600, 1,800, 3,000 5,000	O ..	—	—	—
Sunk Lightship ..	South-east of Harwich 51° 51′ 00″ N. 1° 30′ 00″ E.	GVE	30	Trinity House ..	230	—[8]	N	—[9]	—
Tobermory Radio ..	Isle of Mull 56° 37′ 10″ N. 6° 03′ 30″ W.	GCA	150	Post Office ..	300	—[22, 20]	0800 to 2000	—	—
Tongue Lightship ..	North of Margate 51° 30′ 00″ N. 1° 23′ 00″ E.	GVF	15	Trinity House ..	230	—[8]	N	—[9]	—
Towyn	—	MUV	—	Marconi Co. ..	—	—[20]	—	—	—
Tynemouth	55° 31′ 00″ N. 1° 26′ 00″ W.	BZT	—	Admiralty ..	—	O ..	—	—	—
Valentia Radio ..	51° 55′ 51″ N. 10° 20′ 53.6″ W.	GCK	250	Post Office ..	300, 600	P G ..	N	0.60 [5] 0.33 [6] 0.17 [7]	— 3.30 [6] 1.70 [7]
Wick Radio	North Coast of Scotland 58° 26′ 16″ N. 3° 05′ 53.5″ W.	GKR	—	Post Office ..	300, 600	P G ..	N	0.60 [5] 0.33 [6] 0.17 [7]	— 3.30 [6] 1.70 [7]

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.
								Francs.	Francs.
UNITED STATES OF AMERICA	Meridian of Greenwich.								
Akron, Ohio ..	41° 10′ 00″ N. 81° 40′ 00″ W.	WOI	350	Goodyear Tire and Rubber Co.	300, **600**, 2,000	P ..	0800 to 1630 [3]	—	—
Alpena	Michigan 45° 03′ 00″ N.[5] 83° 20′ 00″ W.	NSM	150	U.S. Navy ..	300, **600**	P G ..	N	0.30	—
Amagansett	New York State	NBM	100	U.S. Navy ..	800	D F[10] ..	N	—	—
Anacostia, District of Columbia[2]	38° 52′ 21″ N. 77° 00′ 11″ W.	NSF	100	U.S. Navy ..	300, **600**	P G[8] ..	N	0.30	—
Annapolis, Maryland NSS	38° 59′ 25″ N. 76° 27′ 00″ W.	NSS	4,000	U.S. Navy ..	300, **600** 17,000 (arc)	O ..	N	—	—
Annapolis, Maryland NZO	—	NZO	—	U.S. Navy ..	—	—	—	—	—
Appledore Island, Maine	70° 36′ 42″ W. 42° 59′ 12″ N.	NTW	100	U.S. Navy ..	800	D F[10] ..	N	—	—
Arlington, Virginia ..	—	—	—	—	2,650	—	—	—	—
Ashtabula	Ohio 41° 50′ 00″ N.[5] 80° 50′ 00″ W.	NQB	150	U.S. Navy ..	300, **600**	P G ..	N	0.30	—
Astoria, Oregon ..	46° 11′ 00″ N.[5] 123° 51′ 00″ W.	NUZ	1,000	U.S. Navy ..	300, **600**	P G ..	N	0.30	—
Avalon, California NZL	118° 20′ 00″ W.[5] 33° 21′ 00″ N.	NZL	150	U.S. Navy ..	300, **600**	P G ..	N	0.30	—
Avalon, California NZL	32° 20′ 39″ N. 118° 18′ 57″ W.	NZL	100	U.S. Navy ..	800	D F[10] ..	N	—	—
Bakersfield	California 118° 50′ 00″ W. 35° 20′ 00″ N.[5]	KDNT	125	San Joaquin Light and Power Corporation	425	P R ..	X	—	—
Baltimore, Maryland	39° 17′ 22″ N. 76° 36′ 41″ W.	NBZ	140	U.S. Navy ..	300, **600**	P G ..	0800 to 2400	0.30	—
Bar Harbor NBD ..	Maine 44° 18′ 36″ N. 68° 11′ 27″ W.	NBD	200	U.S. Navy ..	300, **600**	P G ..	N	0.30	—
Bar Harbour NBD ..	Maine 68° 11′ 27″ W. 44° 18′ 36″ N.	NBD	100	U.S. Navy ..	800	D F[10] ..	N	—	—
Baseline Ranger Station, Arizona	Apache Nat. Forest 33° 22′ 01″ N.[5] 109° 10′ 49″ W.	NZT	30	Dept. of Agriculture	550, 580, 800	O ..	0700 to 2230	—	—

Remarks.

[1] Instructional and experimental

[2] Communicates only with aeroplanes

[3] Mean time of meridian 90° W. of Greenwich

[4] For communication with Koko Head, NPM (Hawaiian Islands)

[5] Approximately

[6] Great Lakes Naval training station

[7] Mean time of the meridian 120° W. of Greenwich

[8] Transocean station

[9] For communication only with Oakland, California

[10] Communicates only with Canton, Ohio

[11] For radiotelegrams exchanged with ships plying within 200 miles of New York (N.Y.)

[12] For other radiotelegrams

[13] No change is made for relaying messages

[14] For radiotelegrams exchanged with coastwise ships

[15] For radiotelegrams exchanged with transoceanic ships

[16] Radio time signals are sent out daily from 2155 to 2200

[17] Time signals are sent daily from 1155 to 1200 (standard time of the

Baytown, Texas ..	95° 00′ 30″ W. 29° 44′ 20″ N.	KDPS	200	Humble Oil Refining Co.	300, 600	P R ..	X	—	—
Beaumont, Texas ..	30° 08′ 00″ N.[8] 93° 58′ 00 W.	WOD	250	Magnolia Petroleum Co.	300, 440, 600	P R ..	X	—	—
Belfast, Maine ..	69° 00′ 25″ W 44° 24′ 50″ N.	WNN	200	International Radio Tel. Co.	300, 450, 600, 1,800	P G ..	N	0.50	—
Bellefonte, Pennsylvania	—	WWQ	—	Post Office Dept.	1,350	—[8]	—	—	—
Belmar	New Jersey	WII	—	Radio Corpn. of America	—	—	N	—	—
Bethany Beach, Delaware	75° 03′ 20″ W. 38° 32′ 45″ N.	NSD	100	U.S. Navy ..	800	D F[19] ..	N	—	—
Binghamton ..	New York 42° 08′ 00″ N. 75° 55′ 00″ W.	WBT	15	Delaware, Lackawanna & Western Railroad Co.	1,610	—	X	—	—
Bird Island, California	122° 32′ 14″ W. 37° 49′ 24″ N.	NLD	100	U.S. Navy ..	800	D F[19] ..	N	—	—
Bolinas KET ..	California 37° 54′ 12″ N. 122° 42′ 30″ W.	KET	6,000	Radio Corpn. of America	5,860, 6,700, 7,020	—[4]	N	—	—
Bolinas KPH ..	California 37° 54′ 12″ N.[5] 122° 42′ 30″ W.	KPH	300	Radio Corpn. of America	300, 450, 600	P G ..	N	0.30	—
Bolinas, California ..	37° 54′ 48″ N. 122° 43′ 33″ W.	NZP	3,500	Radio Corpn. of America ..	—	—[4]	N	—	—
Boston WZAA ..	Massachusetts	WZAA	—	U.S. Signal Corps	—	—	—	—	—
Boston, WBF ..	42° 21′ 33″ N. 71° 03′ 18″ W.	WBF	500	—	300, 600, 1,800	P G ..	N	0.60	—
Brenton Reef Light Vessel (No. 39)	Rhode Island 41° 25′ 00″ N. 71° 22′ 00″ W.	NASB	—	U.S. Navy ..	600	P G ..	N	—	—
Brooklyn, New York NAH	40° 48′ 00″ N.[8] 73° 50′ 00″ W.	NAH	750	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Brooklyn, New York WCG	—	WCG	800	International Radio Tel Co.	300, 450, 600, 1,800	P G ..	N	0.15[11 18] 0.50[18 18]	—
Brownsville, Texas ..	—	WUZ	250	U.S. Army ..	1,000	O ..	X	—	—
Buckroe	Virginia, Fort Monroe	WZL	—	U.S. Army ..	—	O ..	—	—	—
Buffalo, New York	42° 52′ 49″ N. 78° 52′ 36″ W.	NNZ	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Bull Island, South Carolina	—	NZY	—	U.S. Navy ..	800	D F ..	—	—	—
Burrwood, Louisiana NBX	89° 23′ 10″ W. 28° 57′ 27″ N.	NBX	100	U.S. Navy ..	800	D F[19] ..	N	—	—
Burrwood, Louisiana WBW	—	WBW	—	Tropical Radio Tel. Co.	300, 600	P G ..	X	—	—
Butte, Montana ..	—	KMN	—	Great Falls Power Co.	550, 1,700	P R ..	X	—	—
Calumet, Michigan ..	47° 15′ 12″ N. 88° 27′ 12″ W.	NUG	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Camp 60, California	119° 09′ 00″ W. 37° 15′ 00″ N.	KDPV	50	Southern California Edison Co.	300, 540, 600	P R ..	X	—	—
Camp 61, California	119° 05′ 00″ W. 37° 18′ 30″ N.	KDPW	50	Southern California Edison Co.	300, 540, 600	P R ..	X	—	—

meridian 180° W. of Greenwich) on the wavelengths of 4,800 metres (arc) and 2,400 metres (spark)

[18] Time signals are sent daily from 1155 to 1200 and 2155 to 2200 (standard time of the meridian 75° W. of Greenwich) on the wavelength of 2,500 metres

[19] Where two or more direction finding stations have the same call signal it indicates that they are connected by telegraph to and under the control of a central control station, the call signal being the call of the central control station. When a request for bearings is made, the central control station invariably answers with a bearing from each of the direction finding stations under its control

The following signals have been authorised and will be used until further notice:—

Signal	Meaning.
QTE ?	What is my true bearing ?
QTE	Your true bearing is . . degrees from . . direction finding station

To obtain bearings, the direction finding station should be called on 800 metres in the usual manner, and the call followed by the signal "QTE ?" meaning "What is my true bearing?" When told by the direction finding station to "K" (go ahead), the ship's operator should follow the procedure outlined below:

(*a*) Transmit the ship's call signal for 30 seconds;

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge		Remarks.
								Per Word.	Minimum Charge.	
	Meridian of Greenwich.							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*										(*b*) Make dashes, each dash 5 seconds long, for 1 minute, with the ship's call signal after each dash; (*c*) Terminate with the signal "K" (go ahead). If satisfactory bearings are obtained, the operator at the direction finding station will call the vessel in the usual manner and reply "QTE" followed by the true bearing in degrees (0 to 350) spelled out in words, and the name of the direction finding station from which the bearing was obtained; otherwise a repetition of the test will be requested. The ship's operator should acknowledge receipt of the bearings by answering the direction finding station in the usual manner and repeat, in numerals, the bearings received. This procedure enables all stations concerned to check the bearings. All direction finding stations keep watch and transmit on 800 metres for merchant vessels, and this wavelength should be used for calling and answering and carrying on all communication with these stations.
Camp Alfred Vail, New Jersey	—	WUBA	—	U.S. Signal Corps	—	—	—	—	—	
Camp Knox, Kentucky	—	WUBC	—	U.S. War Dept., Signal Corps	—	—	—	—	—	
Camp Marfa, Kentucky	—	WUG	—	U.S. War Dept., Signal Corps	—	—	—	—	—	
Cape Cod NAE ..	Massachusetts 42° 02′ 58″ N. 70° 04′ 32″ W.	NAE	1,000	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
Cape Cod NAE ..	Massachusetts 70° 04′ 32″ W. 42° 02′ 58″ N.	NAE	100	U.S. Navy ..	800	D F [10] ..	N	—	—	
Cape Elizabeth, Maine	70° 12′ 01″ W. 43° 33′ 59″ N.	NAB	100	U.S. Navy ..	800	D F [10] ..	N	—	—	
Cape Fear	North Carolina	NDK	—	U.S. Navy ..	800	D F ..	—	—	—	
Cape Hatteras NDW	Buxton N.C. 35° 14′ 22″ N. 75° 31′ 42″ W.	NDW	150	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
Cape Hatteras NDW	North Carolina 75° 31′ 42″ W. 35° 14′ 22″ N.	NDW	100	U.S. Navy ..	800	D F [10] ..	N	—	—	
Cape Henlopen, Delaware	75° 05′ 28″ W. 38° 47′ 38″ N.	NSD	100	U.S. Navy ..	800	D F [10] ..	N	—	—	
Cape Lookout, North Carolina	76° 32′ 15″ W. 34° 36′ 13″ N.	NAN	100	U.S. Navy ..	800	D F [10] ..	N	—	—	
Cape May WCY ..	New Jersey 38° 55′ 50″ N. 74° 55′ 50″ W.	WCY	—	International Radio Tel. Co.	300, **600**	P G ..	N	0.50	—	
Cape May NSD ..	New Jersey 38° 56′ 41″ N. 74° 53′ 10″ W.	NSD	200	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
Cape May NSD ..	New Jersey 38° 56′ 00″ N. 74° 54′ 34″ W.	NSD	100	U.S. Navy ..	800	D F [10] ..	N	—	—	
Carney's Point ..	New Jersey 39° 43′ 00″ N. 75° 27′ 00″ W.	WPO	100	E. I. du Pont de Nemours & Co.	300, 425, **600**	P ..	X	—	—	
Cascada, California ..	119° 14′ 00″ W. 37° 12′ 00″ N.	KDPU	50	Southern California Edison Co.	300, 540, **600**	P R ..	X	—	—	
Cattle Point, Washington	122° 57′ 42″ W. 48° 27′ 02″ N.	NPN	100	U.S. Navy ..	800	D F [10] ..	N	—	—	

Charleston, South Carolina	[illegible] 42" W.								
Chatham WSO ..	Massachusetts 41° 40′ 00″ N. 69° 51′ 00″ W.	WSO	—	Radio Corpn. of America	—	—	—	—	—
Chatham, Massachusetts WCC	41° 42′ 00″ N. 70° 00′ 00″ W.[5]	WCC	350	Radio Corporation of America	300, 450, **600**	P G ..	N	0.50	—
Chatham, Massachusetts NXA	69° 57′ 53″ W. 41° 42′ 48″ N.	NXA	100	U.S Navy ..	800	D F[19] ..	N	—	—
Cheboygan	Michigan 45° 00′ 00″ N.[5] 85° 00′ 00″ W.	KUXM	100	—	300, 450, **600**	P R	X	—	—
Cheyenne	Wyoming	KDEG	—	Post Office Dept.	2400, 3800	—[3]	X	—	—
Chicago NUR ..	Illinois 41° 52′ 30″ N. 87° 37′ 30″ W.	NUR	150	U.S. Navy ..	300, **600**	P G ..	N	0.30	—
Chicago KDQA ..	Illinois	KDQA	—	U.S. Post Office Dept.	—	—[3]	—	—	—
Chicago WGO ..	41° 50′ 00″ N.[5] 87° 40′ 00″ E.	WGO	—	—	300, 600, **2,000**	P R ..	0830 to 1700	—	—
Cincinnati, Ohio ..	—	KDQC	—	U.S. Post Office Dept.	—	—	—	—	—
Cleveland, Ohio NRH	41° 29′ 59″ N. 81° 31′ 13″ W.	NRH	150	U.S. Navy ..	300, **600**	P G ..	N	0.30	—
Cleveland, Ohio WCX	—	WCX	400	Inter-City Radio Co.	300, **600**, 1,640, 2,050	P R ..	0700 to 2100	—	—
Conneaut Harbour ..	Lake Erie 41° 57′ 00″ N. 80° 36′ 00″ W.	WEV	220	Marquette Besemer Dock and Navigation Co.	300, 475, 540, **600**	P R ..	X	0.15	—
Craftonville	California 34° 05′ 10″ N. 117° 02′ 30″ W.	KJQ	250	Southern California Edison Co.	1,610	P ..	X	—	—
Dallas, Texas ..	32° 47′ 00″ N.[5] 96° 48′ 00″ W.	KUXP	150	—	300, **500**, 600, 1,650	P R ..	N	0.15	1.50
Dearborn, Michigan	42° 18′ 00″ N. 83° 14′ 00″ W.	KDEN	200	Henry Ford ..	300, 460, 480, 500, 520, **600**	P R ..	X	—	—
Deer Island, Massachusetts	70° 57′ 30″ W. 42° 21′ 15″ N.	NAD	100	U.S. Navy ..	800	D F[19] ..	N[20]	—	—
Detour Point, Michigan	83° 54′ 57″ W. 45° 57′ 20″ N.	NZU	100	U.S. Navy ..	800	D F[19] ..	N	—	—
D.L. & W.R.R. Limited Train	—	—	—	Delaware, Lackawanna & Western Railroad Co.	—	—	—	—	—
Denver, Colorado ..	39° 45′ 00″ N. 105° 00′ 00″ W.	KIX	100	William H. Smith	300, **575**	P ..	X	—	—
Detroit, Michigan NRQ	42° 20′ 00″ N.[5] 83° 10′ 00″ W.	NRQ	300	U.S. Navy ..	300, **600**	P G ..	N	0.30	—
Detroit, Michigan WDR	—	WDR	—	Inter-City Radio Co.	300, **600**, 1,850 3,062	P R ..	0700 to 2100	—	—
Detroit, Michigan WOK	42° 20′ 00″ N. 83° 10′ 00″ W.	WOK	300	Goodyear Tire and Rubber Co.	300, **600**, 2,160	P ..	0830 to 1630[8]	—	—
Douglas, Arizona ..	31° 20′ 41″ N. 109° 22′ 24″ W.	KDC	100	The Copper Queen Consolidated Mining Co.	**600**, 1,650	P ..	1000 to 1100[7] 1600 to 1700	—	—
Dry Tortugas, Florida	—	NYZ	—	U.S. Navy ..	300, **600**	P G ..	N	0.30	—

operation of above direction finding stations may be checked up, a brief report should be forwarded to the Director, Naval Communications, Navy Department, Washington, D.C., containing:—

(a) Name of ship;
(b) Name of direction finding station;
(c) Date and Greenwich mean time at which wireless bearing was given;
(d) Bearing given by direction finding station;
(e) Estimated position of ship at above time and date by methods other than wireless;
(f) The probable degree of accuracy of the estimated position;
(g) Weather conditions at above time;
(h) Remarks, if any;
(i) Signature of master or responsible navigating officer.

[20] Only in case of fog

[21] Time signals are sent daily from 1155 to 1200

[22] Shipping traffic, free

[23] Information concerning wrecks, derelicts, ice and other dangerous obstructions to navigation whenever received from the Hydrographic Office or from a branch hydrographic office or other reliable source is sent broadcast four times daily, viz., at 8 a.m., 12 a.m., 4 p.m. and 8 p.m. local (standard) time of the station. Ships within range of a naval radio station should be prepared to receive these hydrographic messages at the hours mentioned and

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast charge. Per Word.	Coast charge. Minimum Charge.	Remarks.
UNITED STATES OF AMERICA—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Duluth, Minnesota ..	46° 47′ 06″ N. 92° 06′ 10″ W.	NUX	250	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	should avoid sending radio messages at these times.
Eagle Harbour, Michigan	88° 08′ 48″ W. 47° 27′ 40″ N.	NUG	100	U.S. Navy ..	800	DF [19] ..	N	—	—	Naval radio stations will furnish this information to passing vessels on
East Hampton, New York State	72° 12′ 33″ W. 40° 57′ 28″ N.	WSA	300	Cutting and Washington Radio Corporation	300, 450, 515, **600**	P G ..	N	0.50	—	request, whenever practicable, at other hours than those mentioned
East Moriches ..	New York State 72° 46′ 05″ W. 40° 48′ 00″ N.	WBC	250	Independent Wireless Telegraph Co.	300, 450, **600**	P G ..	N	0.50	—	above. Should it not be practicable to send out this information on one
East Pittsburg, Pennsylvania	79° 50′ 00″ W. 40° 24′ 00″ N.[8]	KDKA	300	Westinghouse Electric and Manufacturing Co.	500, 3,200	P R ..	0830 to 1700		—	of the hours scheduled it will be held until the next scheduled time and sent
Ecorse, Michigan ..	42° 15′ 17″ N. 83° 07′ 15″ W.	NDL	150	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	out as soon as practicable after each hour
Elko, Nevada ..	—	KDEJ	—	Post Office Dept.	2400, 3400	O ..	X	—	—	scheduled.
Empire, Oregon ..	—	NPF	100	U.S. Navy ..	800	D F [19] ..	N	—	—	Each day at 12 a.m.
Eureka, California NPW	Table Bluff 124° 16′ 22″ W. 40° 41′ 44″ N.	NPW	250	U.S. Navy ..	300, **600**, 2,000	P G ..	N	0.30	—	and 10 p.m. (time of the meridian 75 degrees west of(Greenwich), immediately
Eureka, California NPW	124° 16′ 22″ W. 40° 41′ 44″ N.	NPW	100	U.S. Navy ..	800	D F [19] ..	N	—	—	following the time signal, the naval radio station
Fall River Valley, California	121° 27′ 00″ W. 41° 00′ 00″ N.[8]	KDQN	500	Pacific Gas and Electric Co.	1,650	P R ..	X	—	—	Washington NAA will broadcast such informa-
Fairport, Virginia ..	37° 49′ 53″ N. 76° 17′ 26″ W.	KDAH	175	—	300, 450, **600**	P R ..	0700 to 1800	—	—	tion relating to safe navigation as may be fur-
Fall River Valley ..	California 41° 00′ 00″ N.[8] 121° 27′ 00″ W.	KDQN	500	—	1,650	P R ..	X	—	—	nished it by the Hydrographic Office during the preceding 24 hours. The
Farallon Island, California	123° 00′ 00″ W. 37° 42′ 00″ N	NPI	100	U.S. Navy ..	800	D F [19] ..	N	—	—	same wavelength, 2,500 metres, used in the time
Farrallons, California	37° 41′ 58″ N. 123° 41′ 58″ W.	NPI	150	—	300, **600**	—	N	—	—	signal will be employed
Ferris Oil Field, Wyoming	107° 14′ 00″ W. 4.° 10 00″ N.[8]	KDIC	200	General Pet. Corporation of California	425	P R ..	X	—	—	[24] Communications limited to vessels of the Panama Railroad Co.
Fire Island NAH ..	New York State 40° 38′ 07 N. 73° 12′ 32″ W.	NAH	150	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	

Fire Island NAH	New York State 73° 12' 32" W. 40° 38' 07" N.	NAH	100	U.S. Navy	800	D F	N	—	—
Fort Adams	Rhode Island	WUU	125	U.S. Army	1,100, 1,200	O	X	—	—
Fort Andrews	Massachusetts 42° 08' 04" N. 70° 55' 44" W.	WUA	—	U.S. Army	1,100	O	X	—	—
Fort Barrancas, Florida	30° 20' 43" N. 87° 18' 05" W.	WZD	100	U.S. Army	600, 800, 1,000, 1,150, 1,230	O	X	—	—
Fort Benjamin Harrison	Indiana	WZAE	—	War Department	—	—	—	—	—
Fort Bliss	Texas 31° 45' 00" N. 106° 00' 00" W.	WZO	2,000	U.S. Army	3,100, 6,000, 7,000, 8,000, 10,000	O	N	—	—
Fort Brown, Texas	Brownsville	WUZ	250	U.S. Army	1,350—7,000	O	N	—	—
Fort Casey, Washington	Puget Sound	WZJ	50	U.S. Army	500	O	X	—	—
Fort Caswell, North Carolina	—	WUT	30	U.S. Army	825	O	X	—	—
Fort Constitution, New Hampshire	43° 04' 16" N. 70° 42' 40" W.	WZE	25	U.S. Army	300, 600	O	0800 to 1700	—	—
Fort Crockett, Texas	29° 16' 28" N. 94° 48' 52" W.	WUX	30	U.S. Army	600, 900	O	X	—	—
Fort Dade, Florida	27° 35' 41" N. 82° 45' 45" W.	WZK	25	U.S. Army	825	O	X	—	—
Fort Du Pont	Delaware 39° 34' 10" N. 75° 35' 20" W.	WZN	35	U.S. Army	825	O	X	—	—
Fort Hancock, New Jersey	40° 37' 57" N. 73° 13' 08" W.	WUB	—	U.S. Army	1,200	O	X	—	—
Fort H. G. Wright	New York State 41° 15' 20" N. 72° 01' 12" W.	WUC	150	U.S. Army	600	O	X	—	—
Fort Howard, Maryland WZAC	—	WZAC	—	War Department	—	—	—	—	—
Fort Howard, Maryland WZB	—	WZB	125	U.S. Army	600, 825, 1,200	O	X	—	—
Fort Huachuca	Arizona	WZP	—	U.S. Army	2,300, 2,750	O	N	—	—
Fort Leavenworth	Kansas 39° 21' 00" N. 94° 55' 31" W.	WUD	180	U.S. Army	1,800	O	X	—	—
Fort Levett, Maine	43° 38' 40" N. 70° 11' 39" W.	WUE	—	U.S. Army	300—1,300	O	X	—	—
Fort Mason	California	WZAH	—	War Department	—	—	—	—	—
Fort McIntosh	Laredo, Texas 27° 30' 29" N. 99° 31' 02" W.	WUH	1,000	U.S. Army	1,350—3,050	O	N	—	—
Fort McPherson	Georgia	WZAD	—	War Department	—	—	—	—	—
Fort Monroe	Virginia 37° 00' 06" N. 76° 18' 24" W.	WUF	150	U.S. Army	400, 600, 825, 1,100	O	X	—	—
Fort Morgan, Alabama	Mobile Bay	WUR	50	U.S. Army	600, 1,200	O	X	—	—

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
UNITED STATES OF AMERICA—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Fort Moultrie, South Carolina	—	WZF	50	U.S. Army ..	**600**, 825	O ..	X	—	—	
Fort Omaha ..	Nebraska	WZAG	—	War Department	—	—	—	—	—	
Fort Riley, Kansas	39° 04′ 35″ N. 96° 47′ 01″ W.	WUI	180	U.S. Army ..	1,200	O ..	X	—	—	
Fort Rosecrans ..	California	WUS	50	U.S. Army ..	300, 575	O ..	X	—	—	
Fort Sam Houston ..	Texas 29° 26′ 39″ N. 98° 27′ 44″ W.	WUJ	1,500	U.S. Army ..	3,100—9,500	O ..	N	—	—	
Fort San Jacinto, Texas	29° 19′ 49″ N. 94° 45′ 28″ W.	WUY	30	U.S. Army ..	300, 1,200	O ..	X	—	—	
Fort Screven, Georgia	32° 06′ 34″ N.[5] 80° 50′ 37″ W.	WZA	40	U.S. Army ..	825	O ..	X	—	—	
Fort Sheridan ..	Illinois	WZAF	—	War Department	—	—	—	—	—	
Fort Sill	Oklahoma	WUBD	—	U.S. War Dept., Signal Corps	—	—	—	—	—	
Fort Stevens WUK..	Oregon Mouth Columbia River	WUK	125	U.S. Army ..	1,100	O ..	X	—	—	
Fort Stevens NPE..	Oregon 46° 11′ 32″ N. 123° 59′ 15″ W.	NPE	100	U.S. Navy ..	800	D F[19] ..	N	—	—	
Fort Story, Virginia	36° 55′ 22″ N. 75° 59′ 58″ W.	WXZ	200	U.S. Army ..	360, 525, 825, 1,100	O ..	0800 to 1630 except Saturday afternoon and Sunday	—	—	
Fort St. Philip, Louisiana	30° 45′ 00″ N.[5] 90° 35′ 00″ W.	WXQ	30	U.S. Army ..	450, 600, 1,100	O ..	0800 to 1145 1300 to 1700	—	—	
Fort Totten, New York ..	40° 47′ 38″ N.[5] 73° 47′ 00″ W.	WUL	600	U.S. Army ..	600, 800, 1,100, 1,200	O ..	N	—	—	
Fort Travis, Texas..	29° 21′ 51″ N. 94° 45′ 31″ W.	WXP	30	U.S. Army ..	600, 900	O ..	X	—	—	
Fort Washington, Maryland	39° 00′ 00″ N.[5] 77° 00′ 00″ W.	WYG	25	U.S. Army ..	825, 1,200	O ..	X	—	—	
Fort Whitman, Washington ..	—	WZC	125	U.S. Army ..	400, 1,100	O ..	X	—	—	
Fort Winfield Scott..	California 37° 47′ [illegible] N. [illegible]	WUO	150	U.S. Army ..	1,100	O ..	X	—	—	

Fort Wood WZAB ..	New York State	WZAB	—	War Dept. ..	—	—	—	—	—
Fort Wood WUM ..	New York	WUM	—	U.S. Army ..	1,100	O ..	X	—	—
Fort Worden ..	Washington	WUN	125	U.S. Army ..	1,200	O ..	X	—	—
Fort Worth	Texas 97° 20′ 00″ W. 32° 44′ 00″ N.[5]	KDMK	80	Continental Radio Telegraphic and Telephone Co.	500	P R ..	N	—	—
Fourth Cliff, Massachusetts	70° 42′ 22″ W. 42° 09′ 40″ N.	NAD	100	U.S. Navy ..	800	D F[10] ..	N	—	—
Frankfort. Michigan	44° 37′ 46″ N. 86° 14′ 17″ W.	NSR	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Fresno, California ..	119° 49′ 00″ W. 36° 43′ 00″ N.[5]	KDNU	125	San Joaquin Light and Power Corp.	425	P R ..	X	—	—
Galveston NKB ..	Texas 29° 18′ 54″ N. 94° 46′ 52″ W.	NKB	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Galveston KDLZ ..	Texas	KDLZ	500	Sugarland Industries	300, 375, 425, 600	P R ..	X	—	—
Gloucester, Massachusetts ..	70° 41′ 08″ W. 42° 35′ 19″ N.	NAD	100	U.S. Navy ..	800,	D F[10] ..	N	—	—
Grand Island, Louisiana	89° 59′ 46″ W. 29° 13′ 52″ N.	NLI	100	U.S. Navy ..	800	D F[10] ..	N	—	—
Grand Marais, Michigan	85° 58′ 26″ W. 46° 40′ 37″ N.	NZT	100	U.S. Navy ..	800	D F[10] ..	N	—	—
Great Lakes[6] ..	Illinois 42° 18′ 30″ N. 87° 50′ 00″ W.	NAJ	250	U.S. Navy ..	300, 600 1,500, 1,512	P G ..	N	0.30	—
Hampton Roads ..	Virginia 37° 00′ 00″ N.[5] 76° 18′ 00″ W.	NAM	100	U.S. Navy ..	300, 600	—[8]	N	—	—
Hog Island, Penn...	—	KDAB	—	—	—	P ..	X	—	—
Hog Island, Virginia	75° 42′ 37″ W. 37° 22′ 36″ N.	NCZ	100	U.S. Navy ..	800	D F[10] ..	N	—	—
Hoboken, New Jersey	40° 43′ 00″ N. 74° 02′ 00″ W.	WBU	400	Radio Corpn. of America	2,240 —	P ..	X	—	—
Hollister, California	36° 55′ 43″ N. 121° 24′ 00″ W.	KGH	200	Palmer B. Hewlett	300, 600, 1,650	—[9]	—	—	—
Imperial Beach, California	117° 07′ 55″ W. 32° 35′ 14″ N.	NPL	100	U.S. Navy ..	800	D F[10] ..	N	—	—
Independence, Kansas	37° 14′ 00″ N. 95° 44′ 00″ W.	WQL	150	Kansas Gas & Electric Co.	1,700	P ..	—	—	—
Indian Head, Maryland	38° 38′ 00″ N. 77° 10′ 55″ W.	NBG	50	U.S. Navy ..	300, 600	O ..	X	—	—
Inglewood, California	34° 03′ 05″ N. 118° 14′ 32″ W.	NPX	850	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Jacksonville, Florida	30° 19′ 25″ N. 81° 38′ 56″ W.	NFI	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Johnswood, Michigan	45° 50′ 00″ N.[5] 83° 40′ 00″ W.	KUVQ	—	—	300, 450, 600	P R ..	X	—	—
Jordon, Montana ..	47° 20′ 00″ N.[5] 106° 50′ 00″ W.	KUVR	—	Miles City—Jordon Wireless Co.	500	P R ..	0800 to 1800	—	—
Jupiter NAQ ..	Florida 26° 56′ 54″ N. 80° 04′ 48″ W.	NAQ	250	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Keyport, Washington	47° 37′ 18″ N. 122° 37′ 08″ W.	NPZ	250	U.S. Navy ..	300, 600	P G ..	N	0.30	—

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
UNITED STATES OF AMERICA—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Key West, Florida NAR	24° 32′ 48″ N. 81° 39′ 52″ W.	NAR	250	U.S. Navy ..	300, **600**, 1,500	P G ..	N	0.30	—	
Key West, Florida NAR	—	NAR	100	U.S. Navy ..	800	D F [10] ..	N	—	—	
Lakehurst, New York	—	NEL	100	U.S. Navy ..	800	D F [10] ..	N	—	—	
Leuto	Oregon 45° 23′ 00″ N. 122° 35′ 00″ W.	KFU	—	Federal Telegraph Company	—	—	—	—	—	
Lewistown, Montana	—	KLP	150	Montana Power Co.	300, 600, **1,600**	P ..	X	—	—	
Light Vessel No. 1 ..	Maritime Industry, S.C. 32° 06′ 12″ N. 80° 28′ 00″ W.	NART	100	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 3 ..	Handkerchief, Mass. 41° 29′ 00″ N.[5] 70° 04′ 00″ W.	NAQS	100	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 5 ..	Stone Horse Shoal, Mass. 41° 32′ 00″ N.[5] 69° 59′ 00″ W.	NANT	1,000	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 11	Scotland, N.Y. 40° 26′ 00″ N.[5] 73° 55′ 00″ W.	NARV	125	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 20	Cross Rip. Mass. 41° 26′ 50″ N.[5] 70° 17′ 27″ W.	NAQB	1,000	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 34	Charleston, S.C. 32° 40′ 39″ N.[5] 79° 43′ 41″ W.	NAZJ	100	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 39	Brenton Reef, R.I. 41° 25′ 00″ N.[5] 71° 22′ 00″ W.	NASB	100	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 41	Vineyard Sound Mass.	NACX	100	Dept. of Commerce	300, **600**	—	N	—	—	

Light Vessel No. 42	Hen and Chickens, Mass. 41° 27′ 02″ N. 71° 01′ 06″ W.	NAPP	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 44	North East End, N.J. 38° 37′ 00″ N.[5] 74° 29′ 00″ W.	NARS	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 46	Tail of Horse Shoe, Va. 36° 53′ 49″ N 76° 00′ 24″ W.	NAZR	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 47	Pollock Rip, Mass. 41° 22′ 00″ N.[5] 69° 34′ 00″ W.	NANS	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 48	Cornfield Point, Conn. 41° 13′ 00″ N.[5] 72° 23′ 00″ W.	NASC	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 52	Fenwick Island Shoal, Del. 33° 26′ 00″ N.[5] 74° 46′ 00″ W.	NAJS	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 54	Boston, Mass. 42° 20′ 22″ N. 70° 45′ 26″ W.	NADX	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 66	Great Round Shoals, Mass. 41° 24′ 11″ N. 69° 54′ 55″ W.	NABJ	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 67	Umatilla Reef, Wash. 48° 09′ 00″ N.[5] 124° 51′ 00″ W.	NACV	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 68	Fire Island, N.Y. 40° 28′ 40″ N. 73° 11′ 26″ W.	NSL	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 69	Overfalls, Del. 28° 48′ 00″N.[5] 75° 01′ 00″ W.	NAKT	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 70	San Francisco, Cal. 37° 45′ 03″ N. 122° 41′ 20″ W.	NAKS	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 72	Diamond Shoals, N.C. 35° 05′ 08″ N. 75° 18′ 38″ W.	NITQ	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 73	Pollock Rip Slue, Mass. 41° 36′ 00″ N.[5] 69° 53′ 00″ W.	NAFT	100	Dept. of Commerce	300, 600	—	N	—	—	
Light Vessel No. 74	Portland, Maine 43° 41′ 30″ N. 70° 05′ 38″ W.	NAMS	100	Dept. of Commerce	300, 600	—	N	—	—	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
UNITED STATES OF AMERICA—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Light Vessel No. 79	Five Fathom Bank, N.J. 38° 47′ 00″ N.[5] 74° 34′ 00″ W.	NADV	125	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 80	Cape Lookout Shoals, N.C. 34° 18′ 00″ N.[5] 74° 24′ 00″ W.	NABV	100	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 81	Heald Bank, Texas 29° 06′ 05″ N. 94° 13′ 27″ W.	NLP	100	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 83	Blunts Reef, Cal. 40° 36′ 04″ N. 124° 30′ 14″ W.	NACT	150	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 84	Brunswick, Georgia 31° 00′ 00″ N.[5] 81° 09′ 35″ W.	NABX	125	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 85	Nantucket Shoals, Mass. 40° 37′ 05″ N. 69° 36′ 33″ W.	NLA	150	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 87	Ambrose Channel, N.Y. 40° 36′ 20″ N. 74° 03′ 05″ W.	NALS	100	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 88	Columbia, Oregon 46° 10′ 30″ N.[5] 124° 11′ 00″ W.	NAJT	100	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 91	Winter Quarter Shoals, Va. 37° 55′ 00″ N.[5] 74° 56′ 00″ W.	NADT	100	Dept. of Commerce	300, **600**	—	N	—	—	
Light Vessel No. 93	Swiftsure Bank, Wash 48° 31′ 00″ N.[5] 125° 00′ 00″ W.	NABT	100	Dept. of Commerce	300, **600**	—	N	—	—	

Light Vessel No. 94	Frying Pan Shoals, N.C. 33° 33' 30" N. 76° 48' 20" W.	NLC	110	Dept. of Commerce	300, 600	—	N	—	—
Light Vessel No. 101	Cape Charles, Va. 37° 05' 00" N.[8] 75° 43' 00" W.	NAJV	100	Dept. of Commerce	300, 600	—	N	—	—
Light Vessel No. 102	South Pass, La. 28° 53' 19" N. 89° 26' 34" W.	NAGT	100	Dept. of Commerce	300, 600	—	N	—	—
Long Beach, California	33° 46' 12" N. 118° 11' 17" W.	KUXT	50	—	300, 350, 400, 450, 500, 600	P R ..	0700 to 2300	—	—
Los Angeles, California	34° 04' 00" N. 118° 15' 00" W.	KLS	1,000	Federal Telegraph Company	300, 600, 1,800, 2,800, 3,250	P G ..	0400 to 2200 [8]	—	—
Ludington, Michigan	43° 56' 47" N. 86° 26' 19" W.	NTM	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Mackinac Island ..	Michigan 45° 51' 29" N. 84° 36' 57" W.	NUD	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Manistique NUB ..	Michigan 45° 57' 26" N. 86° 15' 26" W.	NUB	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Manistique NUB ..	Michigan 86° 14' 00" W. 45° 56' 48" N.	NUB	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Manitowoc	Wisconsin 44° 07' 00" N.[8] 87° 45' 00" W.	NTY	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Mantoloking ..	New Jersey 74° 03' 10" W. 40° 01' 30" N.	NAH	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Mare Island	California 38° 05' 55" N. 120° 00' 09" W.	NPG	250	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Marion, Massachusetts NMM	—	NMM	—	Radio Corpn. of America	—	—	—	—	—
Marion, Massachusetts WSO	—	WSO	—	Radio Corpn. of America	12,000	P R ..	N	—	—
Marshfield, Oregon ..	43° 22' 26" N. 124° 12' 50" W.	NPF	250	U.S. Navy ..	300, 600, 952	P G ..	N	0.30	—
Miami, Florida ..	25° 48' 21" N. 80° 07' 15" W.	NGE	250	U.S. Navy ..	300, 600, 800	P G ..	N	0.30	—
Miles City	Montana 46° 24' 22" N. 105° 49' 31" W.	KUXN	100	Miles City—Jordon Wireless Co.	500	P R ..	0800 to 1800	—	—
Milwaukee, Wisconsin	43° 02' 50" N. 87° 50' 00" W.	NUK	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Minneapolis, Minnesota	—	KDPB	—	Post Office Dept.	—	—	—	—	—
Mobile, Alabama ..	30° 41' 34" N. 88° 02' 27" W.	NGT	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Montauk, New York State	71° 57' 27" W. 41° 03' 39" N.	NAH	100	U.S. Navy ..	800	D F [10] ..	N	—	—

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
UNITED STATES OF AMERICA—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Morehead City, North Carolina	76° 39′ 00″ W. 34° 43′ 12″ N.	NAN	150	U.S. Navy ..	300, **600**	P G [22] ..	N	0.30	—	
Morris Island, South Carolina	79° 53′ 17″ W. 32° 41′ 36″ N.	NZV	100	U.S. Navy ..	800	D F [10] ..	N [20]	—	—	
Mount Vernon, Ohio	40° 24′ 00″ N. 82° 31′ 00″ W.	WQV	80-90	B. J. Hyatt ..	500	—[10]	X	—	—	
Newark, New Jersey	—	WWU	—	Post Office Dept.	—	—[5]	X	—	—	
New Brunswick, New Jersey	40° 31′ 00″ N.[5] 74° 29′ 00″ W.	NFF	125	U.S. Navy ..	300, **600**	O ..	N	—	—	
New Brunswick, New Jersey WII ..	—	WII	3,000	Radio Corpn. of America	13,600	P R ..	N	—	—	
New Brunswick, New Jersey WNY	40° 30′ 10″ N. 74° 29′ 15″ W.	WNY	250	Radio Corpn. of America	300, 450, **600**	P G ..	N	0.50	—	
New Dungeness, Washington	123° 07′ 57″ W. 48° 10′ 12″ N.	NFT	100	U.S. Navy ..	800	D F [10] ..	N	—	—	
New London, Connecticut	—	WLC	150–300	International Radio Tel. Co.	300, **600**, 1,800	P G ..	N	0.15[11, 12] 0.50[12, 13]	—	
New Orleans NAT ..	Louisiana 29° 52′ 50″ N. 90° 02′ 18″ W.	NAT	250	U.S. Navy ..	300, **600**, 1,000	O ..	N	—	—	
New Orleans WNU	—	WNU	—	Tropical Radio Tel. Co.	300, **600**	P G ..	X	—	—	
New Prague, Minnesota	93° 31′ 12″ N. 44° 32′ 39″ W.	WPU	300	New Prague Flour Mill Co.	500	P ..	X	—	—	
Newport, Rhode Island	41° 39′ 12″ N. 71° 20′ 00″ W.	NAF	250	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
Newport, Rhode Island WCI ..	—	WCI	—	International Radio Tel. Co.	300, **600**	P G ..	X	0.15[11, 12] 0.50[12, 13]	—	
New York KDKF ..	74° 00′ 35″ W. 40° 42′ 10″ N.[5]	KDKF	100	Seamen's Church Institute	200, 300, 450, **600**	P R ..	0900 to 1700 (except Sundays)	—	—	
New York KUVS ..	—	KUVS	—	Police Dept. ..	300, **600**	P R ..	N	—	—	
New York WHB ..	—	WHB	—	E. J. Simon ..	300, **600**, 2,710	P R ..	X	0.30	—	
New York WHI ..	40° 43′ 50″ N. 73° 59′ 31″ W.	WHI	100	—	300, **600**, 1,700	P R ..	0900 to 1700	—	—	
New York WNY ..	—	WNY	—	Radio Corpn. of America	300, 450, **600**	P G ..	N	0.30	—	
New York WSE ..	40° 40′ 15″ N. 73° 20′ 31″ W.	WSE	300-400	Independent Wireless Tel. Co.	300, 450, **600** 1,800	P G ..	N	0.50	—	

New York WSK ..	New York State 74° 00′ 58″ W. 40° 45′ 29″ N.	WSK	100	Panama Railroad Co.	300, 450, 600	P R [14] ..	X	0.50	—
Norfolk, Virginia ..	36° 49′ 33″ N. 76° 17′ 46″ W.	NAM	250	U.S. Navy ..	300, 600	P G ..	N	0.30	—
North Head	Washington 46° 17′ 57″ N. 124° 04′ 48″ W.	NPE	500	U.S. Navy ..	300, 600, 2,800	P G ..	N	0.30	—
North Island, South Carolina	79° 11′ 06″ W. 33° 13′ 21″ N.	NZW	100	U.S. Navy ..	800	D F [10] ..	N	—	—
North Platte, Nebraska	—	KDHM	—	Post Office ..	2,400, 3,490	—[3]	X	—	—
Northville, Michigan	42° 20′ 00″ N. 83° 29′ 00″ W.	KDEP	150 150	Henry Ford ..	300, 500, 600	P R ..	X	—	—
Oakland, California..	37° 48′ 41″ N. 122° 16′ 14″ W.	KGI	150	Ellery W. Stone	300, 500, 600	P ..	N	—	—
Ocean Park, Washington	124° 03′ 30″ W. 46° 27′ 45″ N.	NPE	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Ogden, Utah ..	41° 18′ 08″ N. 111° 59′ 54″ W.	KUPQ	28	—	200, 425	P R ..	X	—	—
Omaha, Nebraska ..	—	KDEF	—	Post Office Dept.	1,050	—[3]	X	—	—
Pass a Loutre, Louisiana ..	89° 02′ 26″ W. 29° 11′ 24″ N.	NBX	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Pedrocitas, California	33° 20′ 15″ N. 118° 18′ 40″ W.	KUXV	50	Pacific Telephone and Tel. Co.	300, 350, 400, 450, 500, 600	P R ..	0700 to 2300	0.25	3.00
Pensacola, Florida ..	30° 20′ 49″ N. 87° 16′ 06″ W.	NAS	150	U.S. Navy ..	300, 600	—[3]	N	—	—
Philadelphia NAI ..	Pennsylvania 39° 52′ 20″ N. 75° 10′ 50″ W.	NAI	250	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Philadelphia WHE ..	39° 57′ 06″ N. 75° 09′ 44″ W.	WHE	100	—	300, 600, 1,700	P R ..	0900 to 1700	—	—
Phœnix, Arizona ..	—	KHQ	300	Federal Telegraph Co.	3,000, 3,400	P ..	Local Time. 0600 to 1800	—	—
Point Arguello NPK	California 34° 34′ 35″ N. 120° 38′ 48″ W.	NPK	150	U.S. Navy ..	300, 600, 952, 1,512	P G ..	N	0.30	—
Point Arguello NPK	California 120° 38′ 48″ W. 34° 34′ 35″ N.	NPK	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Point Fermin, California	118° 17′ 37″ W. 33° 42′ 19″ N.	NPX	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Point Hueneme, California	119° 12′ 30″ W. 34° 08′ 40″ N.	NMD	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Point Isabel ..	Texas 26° 04′ 12″ N. 97° 12′ 29″ W.	NAY	250	U.S. Navy ..	300, 600, 2,350	P G ..	N	0.30	—
Point Loma, California	117° 15′ 20″ W. 32° 42′ 30″ N.	NPL	100	U.S. Navy .	800	D F [10] ..	N	—	—
Point Montara, California	122° 31′ 06″ W. 37° 32′ 04″ N.	NLH	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Point Reyes, California	122° 59′ 30″ W. 38° 02′ 31″ N.	NLG	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Port Angeles, Washington	—	NFT	100	U.S. Navy .	800	D F [10] ..	N	—	—

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
UNITED STATES OF AMERICA—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Port Arthur, Texas..	29° 52′ 46″ N. 93° 55′ 35″ W.	NJY	200	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
Port Eads, Louisiana	—	WZH	—	U.S. Signal Corps	—	—	—	—	—	
Portland, Maine ..	43° 33′ 58″ N. 70° 12′ 00″ W.	NAB	250	U.S. Navy	300, **600**	P G ..	N	0.30	—	
Portland, Oregon KDP	45° 30′ 45″ N. 122° 42′ 30″ W.	KDP	150	Charles L. Austin	200, 300, 425, 550, **600**	P ..	X	—	—	
Portland, Oregon KGN	45° 32′ 00″ N. 122° 41′ 00″ W.	KGN	150	North Western Electric Co.	300, **600**, 1,700	P ..	X	—	—	
Port Royal, South Carolina	32° 30′ 00″ N. 80° 42′ 00″ W.	NAV	100	U.S. Navy ..	300, **600**	O ..	N	—	—	
Portsmouth, New Hampshire	43° 04′ 33″ N. 70° 44′ 00″ W.	NAC	150	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
Poyner's Hill, N. Carolina	—	NCZ	100	U.S. Navy ..	800	D F[10] ..	N	—	—	
Price's Neck, Rhode Island	71° 20′ 15″ W. 41° 27′ 06″ N.	NAF	100	U.S. Navy ..	800	D F[10] ..	N	—	—	
Providence, Rhode Island	41° 49′ 00 N. 71° 25′ 00″ W.	WPF	100	Dutee W. Flint ..	300, 450, **600**	P ..	X	—	—	
Puget Sound, Washington ..	47° 37′ 18″ N. 122° 37′ 08″ W.	NPZ	250	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
Quincy, Massachusetts	42° 14′ 16″ N. 70° 58′ 39″ W.	KDGU	100	Bethlehem Ship building Corp.	300, **600**, 1,985	P R ..	X	—	—	
Rainbow, Montana..	47° 35′ 00″ N.[3] 111° 10′ 00″ W.	KLQ	200	Great Falls Power Company	550, **1,700**	P R ..	X	—	—	
Rawlins, Wyoming	107° 10′ 00″ W. 41° 45′ 00″ N.	KDIB	200	General Pet. Corporation of California	425	P R ..	X	—	—	
Relief Lightship No. 53	—	NAJC	—	U.S. Navy ..	300, **600**	—	N	—	—	
Reno, Nevada ..	—	KDEK	—	Post Office Dept.	2,400, 2,800, 3,700	—[8]	X	—	—	
Rockaway Beach, New York	—	NBT	—	—	—	—	—	—	—	
Rockland, Maine ..	44° 07′ 30″ N.[3] 69° 07′ 00″ W.	WST	300	East Coast Fisheries Co.	300 450, **600**	P G ..	N	0.50	—	
Rock Springs, Wyoming	—	KDHN	—	Post Office ..	2,400, 3,200,	—[8]	X	—	—	
Salt Lake, Utah ..	—	KDEH	—	Post Office Dept.	2,400, 3,600	—[8]	X	—	—	

Sandy Hook, New Jersey	73° 59′ 33″ W. 40° 27′ 28″ N.	NAH	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Savannah	Georgia 32° 05′ 15″ N. 81° 07′ 15″ W.	NEV	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Sayville, New York State	Long Island 40° 14′ 46″ N. 73° 06′ 12″ W.	NDD	3,000	U.S. Navy ..	—	O ..	N	—	—
Scranton, Pennsylvania	41° 24′ 00″ N. 75° 42′ 00″ W.	WTP	—	Delaware, Lackawanna and Western Rld. Co.	—	—	—	—	—
Sea Gate	New York State Long Island 40° 34′ 23″ N. 74° 00′ 12″ W.	NAH	150	U.S. Navy ..	3,00 600	P G ..	N	0.30	—
Seattle KPA ..	Washington 47° 39′ 06″ N. 122° 22′ 12″ W.	KPA	200	Puget Sound Wireless Tel. Co.	300, 600	P G ..	N	0.30	—
Seattle KPE ..	Washington 47° 37′ 00″ N. 122° 20′ 00″ W.	KPE	300	City of Seattle Harbour Dept.	300, 450, 550, 600	P R ..	N	0.30	—
Seattle NVL ..	Washington 47° 38′ 00″ N.[5] 122° 20′ 00″ W.	NVL	250	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Siasconset NBS ..	Massachusetts Nantucket Island 41° 15′ 50″ N. 69° 58′ 19″ W.	NBS	150	U.S. Navy ..	300, 600	P G ..	N	0.30	—
Siasconsett WSC ..	Massachusetts 69° 58′ 19″ W. 41° 15′ 50″ N.	WSC	300	International Radio Tel. Co.	300, 450, 600	P G ..	X	0.40	—
Slip Point, Washington	—	NPD	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Smith Island, Washington	—	NFH	100	U.S. Navy ..	800	D F [10] ..	N	—	—
Sugarland	Texas	KDLY	500	Sugarland Industries	300, 375, 425, 600	P R ..	X	—	—
Surfside Nantucket, Massachusetts	70° 05′ 56″ W. 41° 14′ 42″ N.	NBS	100	U.S. Navy ..	800	D F [10] ..	N	—	—
S. Augustine, Florida	North-east Coast of Florida 29° 53′ 07″ N. 81° 17′ 12″ W.	NAP	200	U.S. Navy ..	300, 600,	P G ..	N	0.30	—
S. Diego, California KDPT	117° 10′ 00″ W. 32° 43′ 00″ N.[5]	KDPT	150	Southern Electrical Co.	200, 300, 425, 600	P R ..	X	—	—
S. Diego, California NPL	117° 15′ 00″ W. 32° 40′ 30″ N.	NPL	250	U.S. Navy ..	300, 600, 952, 2,400, 9,800	P G ..	N	0.30	—
S. Francisco KDQO	California 122° 26′ 00″ W. 37° 48′ 00″ N.[5]	KDQO	500	Pacific Gas and Electric Co.	500, 600, 1,650	P R ..	X	—	—
S. Francisco KDRO	California 37° 45′ 15″ N. 122° 23′ 07″ W.	KDRO	100	Bethlehem Shipbuilding Corporation	300, 450, 600, 1,605	P R ..	X	—	—
S. Francisco NPG ..	California 37° 49′ 36″ N. 122° 30′ 06″ W.	NPG	250	U.S. Navy ..	300, 600	O ..	N [16]	—	—

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge: Per Word.	Coast Charge: Minimum Charge.	Remarks.
UNITED STATES OF AMERICA—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
S. Francisco NPG ..	—	NPG	250	U.S. Navy ..	300, 600, 952, 2,400, 4,800	—[17]	—	—	—	
S. Louis, Missouri ..	—	KDEL	—	Post Office Dept.	1,300	—[3]	X	—	—	
S. Pedro, California	33° 44′ 00″ N.[5] 118° 17′ 00″ W.	NPX	200	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
S. Petersburg, Florida	82° 25′ 36″ W. 27° 56′ 54″ N.	NGL	—	U.S. Navy ..	300, **600**	P G[22] ..	N	0.30	—	
Tatoosh NPD ..	Washington 48° 43′ 00″ N. 124° 44′ 06″ W	NPD	250	U.S. Navy ..	300, **600**, 952	P G ..	N	0.30	—	
Tatoosh NPD ..	Washington 48° 23′ 59″ N. 124° 44′ 10″ W.	NPD	100	U.S. Navy ..	800	D F[19] ..	N	—	—	
Thompson Falls, Montana	—	KLL	—	Thompson Falls Power Co.	550, **1,700**	P R ..	X	—	—	
Thunder Bay Island, Michigan	83° 11′ 36″ W. 45° 02′ 12″ N.	NSM	100	U.S. Navy ..	800	D F[19] ..	N	—	—	
Tuckerton, New Jersey	39° 33′ 00″ N.[5] 74° 23′ 00″ W.	WGG	4,000	Radio Corpn. of America	300, **600**, 8,000	P R ..	N	—	—	
Tulsa	Oklahoma 36° 10′ 00″ N.[5] 96° 00′ 00″ W.	KDGT	200	Southwestern W.T. & Telephone Co.	425, 450	P R ..	N	—	—	
Tybee Island ..	Georgia	NEV	100	U.S. Navy ..	800	D F[19] ..	N	—	—	
Underwood, Washington	45° 45′ 00″ N. 121° 32′ 00″ W.	KGO	75	North-Western Electric Co.	300, **600**, 1,700	—	X	—	—	
University of Florida	—	NUGC	—	U.S. Navy ..	300, **600**	P ..	N	—	—	
Victor, Colorado ..	38° 40′ 00″ N. 105° 07′ 00″ W.	KIW	160	Ajax Gold Mining Co.	575	—	—	—	—	
Virginia Beach NCZ	Virginia entrance to Chesapeake Bay 36° 50′ 58″ N. 75° 58′ 58″ W.	NCZ	135	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
Virginia Beach NCZ	Virginia 36° 55′ 16″ N. 75° 59′ 51″ W.	NCZ	100	U.S. Navy ..	800	D.F. ..	N	—	—	

Washington NAA ..	Virginia 38° 52′ 05″ N. 77° 04′ 47″ W.	NAA	1,000 (spark) 2,000 (c.w.)	U.S. Navy ..	300, 600, 2,500 (spark) 6,000 (c.w.)	O ..	—	—	—	
Washington NAL ..	District of Columbia 38° 52′ 21″ N. 77° 00′ 11″ W.	NAL	250	U.S. Navy ..	300, 600	P G ..	N	0.30	—	
Washington WUQ ..	District of Columbia	WUQ	—	U.S. Bureau of Standards	—	O ..	—	—	—	
Washington WWV	District of Columbia	WWV	—	—	—	O ..	X	—	—	
Wells, Minnesota ..	93° 45′ 00″ N. 43° 45′ 00″ W.	WPT	150	Wells Flour Mill Co.	500	P ..	X	—	—	
Whitefish Point, Michigan	84° 57′ 22″ W. 46° 46′ 15″ N.	NZT	100	U.S. Navy ..	800	D F [19] ..	N	—	—	
Wichita, Kansas ..	37° 42′ 00″ N.	WQM	200	Kansas Gas and Electric Co.	1,700	P ..	X	—	—	
Wichita Falls ..	Texas 33° 54′ 00″ N.[3] 98° 22′ 00″ W.	KUXQ	150	Continental Radio Telegraph and Telephone Co.	1,750	P R ..	N	0.15	1.50	
Wilmington, Delaware	39° 44′ 16″ N. 75° 32′ 52″ W.	WPP	300	E. I. Dupont de Nemours & Co.	300, 425, 600	—	X	—	—	
Yerba Buena, California	Goat Island 37° 48′ 30″ N. 122° 22′ 02″ W.	NPG	125	U.S. Navy ..	300, 600	P R ..	N	0.30	—	
URUGUAY										
Banco Ingles ..	To the south-east of Montevideo 35° 06′ 30″ S. 55° 53′ 30″ W.	CWC	100	Government ..	450, 600	—	—	—	—	[1] The station transmits a weather report each day except Sunday. (See International Time and Weather Signals)
Cerrito	Near Montevideo 34° 51′ 20″ S. 56° 10′ 10″ W.	CWA	1,000	Government ..	600, 1,000, 1,250	P G [1] ..	N	0.536	5.36	
Isla de Lobos ..	35° 01′ 39″ S. 54° 53′ 01″ W.	CWB	100	Government ..	450, 600	—	—	—	—	
VENEZUELA										
Caracas	10° 30′ 24″ N. 66° 55′ 45.45″ W.	HRE	300	—	600, 900, 2,200 (c.w. and i.c.w.)	P G ..	0800 to 1200 2000 to 2400	0.60	6.00	
La Guayra	10° 36′ 49″ N. 66° 56′ 45″ W.	HRH	600	—	600, 1,200, 2,200, 3,600 (arc)	P G ..	N	0.60	6.00	
Maracay	10° 15′ 37″ N. 67° 36′ 45″ W.	HRF	400	—	600, 900, 2,200 (c.w. and i.c.w.)	P G ..	0800 to 1200 2000 to 2400	0.60	6.00	
Maracaybo	10° 38′ 32″ N. 71° 36′ 30″ W.	HRI	400	—	600, 900, 1,200 (spark)	P G ..	N	0.60	6.00	

Land Stations—*Continued*

Name.	Geographical Position.	Call Signal.	Normal Range in Nautical Miles.	Controlled by	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service.	Hours of Service.	Coast Charge. Per Word.	Coast Charge. Minimum Charge.	Remarks.
VENEZUELA—*contd.*	Meridian of Greenwich.							Francs.	Francs.	
Puerto Cabello ..	10° 29′ 42″ N. 68° 00′ 30″ W.	HRK	300	—	**600**, 900, 2,200 (c.w. and i.c.w.)	P G ..	0800 to 1200 2000 to 2400	0.60	6.00	
S. Christobal, Venezuela	7° 46′ 11″ N. 72° 14′ 30″ W.	HRG	600	—	**600**, 1,200, 2,200, 3,600 (arc)	P G ..	0800 to 1200 2000 to 2400	0.60	6.00	
VIRGIN ISLANDS										
St. Croix	18° 12′ 12″ N. 64° 40′ 05″ W.	NNI	50	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
St. Thomas	18° 20′ 23″ N. 64° 55′ 52″ W.	NBB	100	U.S. Navy ..	300, **600**	P G ..	N	0.30	—	
WASHINGTON ISLAND										
Washington Island..	4° 43′ 00″ N. 160° 25′ 30″ W.	VQO	Day 300 Night 500	F. R. Pelly ..	300, **600**	P R [1] ..	—	0.60	—	[1] The station also exchanges official and public correspondence with Fanning Island
WINDWARD PASSAGE (See **NAVASSA ISLAND**)										
ZANZIBAR										
Pemba, Zanzibar ..	5° 14′ 20″ S. 39° 46′ 06″ E.	VQE	85	Government ..	300, **600**	P G [1] ..	Local Time. 0800 to 1200 1400 to 1600	0.20	1.60	[1] The station also exchanges official and public correspondence with Zanzibar
Zanzibar	6° 09′ 58″ S. 39° 11′ 29″ E.	VPZ	300	—	300, **600**	P G [2] ..	0800 to 1200 1400 to 1600	0.20	1.60	[2] The station also exchanges public and official correspondence with Pemba, Zanzibar

B.

SHIP STATIONS.

B. SHIP STATIONS

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
ARGENTINE REPUBLIC									
Alferez Mackinlay	LNB	—	Navy	450, **600**	O	N	—	—	[1] Operated and controlled by the owner
Almirante Brown	LKA	—	Navy	450, **600**	O	N	—	—	
Argentino LMS [1]	LMS	260	Soc. Impta. y. Expta. de la Patagonia	300, **600**	P G	N	0.40	4.00	
Aristobulo de Valle	LKX	—	Government	300, 450, **600**	O	N	—	—	
Asturiano [1]	LMT	260	Soc. Impta. y Expta. de la Patagonia	300, **600**	P G	N	0.40	4.00	
Azopardo	LNF	—	Navy	300, 450, **600**	O	N	—	—	
Bahia Blanca LMK	LMK	—	Navy	300, **600**	O	N	—	—	
Belgrano LKB	LKB	—	Navy	450, **600**	O	N	—	—	
Berna [1]	LLN	135	Nicolás Mihanovich, Ltd.	300, **600**	P G	N	0.40	4.00	
Bruselas [1]	LLO	135	Nicolás Mihanovich, Ltd.	300, **600**	P G	N	0.40	4.00	
Buenos Aires LKC	LKC	—	Navy	450, **600**	O	N	—	—	
Cabo Corrientes [1]	LMO	300	A. M. Delfino y Hermano	300, **600**	P G	N	0.40	4.00	
Cabo S. Maria [1]	LMN	300	A. M. Delfino y Hermano	300, **600**	P G	N	0.40	4.00	
Camarones [1]	LME	600	A. M. Delfino y Hermano	300, 450, **600**	P G	N	0.40	4.00	
Catamarca	LKD	—	Navy	450, **600**	O	N	—	—	
Chaco	LKE	—	Government	450, **600**	O	N	—	—	
Chubut	LKI	—	Navy	450, **600**	O	N	—	—	
Ciudad de Buenos Aires [1]	LLP	135	Nicolás Mihanovich, Ltd.	300, **600**	P G	N	0.40	4.00	
Colonia LLQ [1]	LLQ	135	Nicolás Mihanovich, Ltd.	300, **600**	P G	N	0.40	4.00	
Cordoba LKF	LKF	—	Navy	450, **600**	O	N	0.40	4.00	
Corrientes LNG	LNG	—	Navy	**300**, 450	O	N	—	—	
Draga 13	LNL	55	Government (Department of Public Works)	400	O	X	—	—	
Draga 14C.	LNK	60	Government	400	O	X	—	—	
Draga 16C.	LMQ	100	Government	450	O	0900 to 1100 1500 to 1700	—	—	
Draga 209	LLH	—	Government	500	O	N	—	—	
Draga 210	LLI	—	Government	500	O	N	—	—	
Draga 211	LLJ	—	Government	500	O	N	—		
Draga 212C.	LMW	216	Government	2,000	O	0900 to 1100 1500 to 1700	—	—	
El Plata LKG	LKG	—	Navy	450, **600**	O	N	—	—	
Entre Rios LKH	LKH	–	Navy	450, **600**	O	N	—	—	
Eolo	LLR	135	Nicolás Mihanovich, Ltd.	300, **600**	P G	N	0.40	4.00	
Formosa LMU [1]	LMU	50	Domingo Barthe	300, **600**	P G	N	0.40	4.00	
Fragata Sarmiento	LKJ	—	Navy	450, **600**	O	N	—	—	
Garibaldi LKK	LKK	—	Navy	450, **600**	O	N	—	—	

[illegible]	[illegible]	[illegible]	Navy [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	135	Nicolás Mihanovich, Ltd.	[illegible]	P G	N	0.40	4.00
[illegible] Nacional	LKM	—	Navy	450, [illegible]	O	N	—	—
[illegible] LLT [1]	LLT	135	Nicolás Mihanovich, Ltd.	300, 600	P G	N	0.40	4.00
Humaitá [1]	LMV	150	Domingo Harthe	300, 600	P G	N	0.40	4.00
Independencia	LKN	—	Navy	450, 600	O	N	—	—
Ingeniero Iribas	LLL	—	Navy	500	O	N	—	—
Ingeniero Luis. A. Huergo	LKS	—	Government	300, 450, 600	O	N	—	—
Jujuy	LKO	—	Navy	450, 600	O	N	—	—
Labrador LLU	LLU	80	Nicolás Mihanovich, Ltd.	300, 600	P G	N	0.40	4.00
Lambaré [1]	LLV	135	Nicolás Mihanovich, Ltd.	300, 600	P G	N	0.40	4.00
La Plata LKP	LKP	—	Navy	450, 600	O	N	—	—
Libertad	LKQ	—	Navy	450, 600	O	N	—	—
Lisboa	LLM	135	Nicolás Mihanovich, Ltd.	300, 600	P G	N	0.40	4.00
Londres [1]	LLW	135	Nicolás Mihanovich, Ltd.	300, 600	P G	N	0.40	4.00
Los Andes LKR	LKR	—	Navy	450, 600	O	N	—	—
Madrid LLY	LLY	135	Nicolás Mihanovich, Ltd.	300, 600	P G	N	0.40	4.00
Ministro Escurra	LNA	—	Government	450, 600	O	N	—	—
Misiones	LNH	—	Navy	600, 450	O	N	—	—
Moreno	LKT	—	Navy	600-1,500	O	N	—	—
Nueve de Julio	LKU	—	Navy	450, 600	O	N	—	—
Ona	LNC	—	Government	450, 600	O	N	—	—
Pampa	LKV	—	Government	450, 600	O	N	—	—
Pampero	LLK	—	Government	300	O	N	—	—
Parana LKW	LKW	—	Navy	450, 600	O	N	—	—
Paris LLZ [1]	LLZ	135	Nicolás Mihanovich, Ltd.	300, 600	P G	N	0.40	4.00
Patagonia	LML	—	Government	300, 600	O	N	—	—
Patria LKY	LKY	—	Navy	450, 600	O	N	—	—
Piedrabuena	LKZ	—	Navy	300, 450, 600	O	N	—	—
Presidente Mitre [1]	LMG	600	A. M. Delfino y Hermano	300, 450, 600	P G	N	0.40	4.00
Presidente Quintana [1]	LMH	600	A. M. Delfino y Hermano	300, 450, 600	P G	N	0.40	4.00
Primero de Mayo	LLA	—	Navy	450, 600	O	N	—	—
Pueyrredón	LLB	—	Navy	450, 600	O	N	—	—
Querandi	LND	—	Navy	450, 600	O	N	—	—
Rio de la Plata LMI	LMI	150	Compañia de Nav. Santiago Lambruschini	300, 600	O	N	0.40	4.00
Rio Negro LNE	LNE	—	Government	450, 600	O	—	—	—
Rio Uruguay	LMJ	150	Compañia de Nav. Santiago Lambruschini	300, 600	O	N	0.40	4.00
Rivadavia	LLC	—	Navy	600-1,500	O	N	—	—
Rosario LLD	LLD	—	Navy	450, 600	O	N	—	—
San Martin LLE	LLE	—	Navy	450, 600	O	N	—	—
San Martin LMM [1]	LMM	135	Nicolás Mihanovich, Ltd.	300, 600	P G	N	0.40	4.00
Triton LMB	LMB	135	Nicolás Mihanovich, Ltd.	300, 600	P G	N	0.40	4.00
Uruguay LLF	LLF	—	Navy	450, 600	O	N	—	—
Venus LMC [1]	LMC	135	Nicolás Mihanovich, Ltd.	300, 600	P G	N	0.40	4.00
Vicente Fidel Lopez	LMR	80	Navy	300, 450, 600	O	X	—	—
Washington LMD	LMD	135	Nicolás Mihanovich, Ltd.	300, 600	P G	N	0..0	4.00
AUSTRALIAN COMMONWEALTH								
Adelaide	GABC	—	Navy	—	—	—	—	—
Anzac	GABD	—	Navy	—	—	—	—	—
Apolda [1]	CGZ	—	Birt & Co.	—	—	—	—	—

[1] Operated and controlled by the Amalgamated Wireless (Australasia) Ltd., Sydney

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.
							Francs.	Francs.
AUSTRALIAN COMMONWEALTH—*contd.*								
Araluen [1]	VJV	200	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.40	—
Aramac [1]	VJJ	240	Australian United S.N. Co.	300, **600**	P G	—[3]	2.20	—
Arawatta [1]	VKV	240	Australian United S.N. Co.	300, **600**	P G	—[3]	2.20	—
Australbrook [1]	CGN	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	2.20	—
Australbush [1]	CGC	—	Commonwealth Govt. Line	300, **600**	P G	—[3]	—	—
Australcrag [1]	VZQ	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	—	—
Australdale [1]	CGF	—	Commonwealth Govt. Line	300, **600**	P G	—[3]	—	—
Australfield	VZU	—	Commonwealth Govt. Line	300, **600**	P G	—[3]	—	—
Australford [1]	CGE	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.20	—
Australglen [1]	CGD	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.20	—
Australmead [1]	VZW	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	2.20	—
Australmount [1]	VZY	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	2.20	—
Australpeak [1]	VZS	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	2.20	—
Australplain [1]	CGB	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	2.20	—
Australpool [1]	VZP	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	2.20	—
Australport [1]	VZT	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	2.20	—
Australrange [1]	CGA	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	2.20	—
Australstream [1]	CGG	—	Commonwealth Govt. Line	300, **600**	P G	—[3]	2.20	—
Baldina	—	—	Adelaide S.S. Co.	—	—	—	—	—
Bakara [3]	VJS	325	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.40	—
Bambra [3]	VXB	200	Western Australia Govt.	300, **600**	P G	—[3]	0.20	—
Barambah [3]	VJR	325	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.40	—
Bellata [1]	CGI	300	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.20[8] 0.40[9]	—
Berringa [1]	VXC	300	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.20[8] 0.40[9]	—
Bethanga [1]	VXF	300	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.20[8] 0.40[9]	—
Bingera [1]	VJD	240	Australian United S.N. Co.	300, **600**	P G	—[3]	2.20	—
Birriwa [1]	CGW	300	Commonwealth Govt. Line	300, **600**	—	—[3]	0.20[8] 0.40[9]	—
Bombala [1]	VHF	250	Australian S.S., Ltd.	300, **600**	P G	—[3]	0.20	—
Boonah [3]	VJQ	325	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.40	—
Booral [3]	CGH	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.40	—
Boorara [3]	VJT	325	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.40	—
Bulla [3]	VJP	250	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.40	—
Bundarra [1]	VXM	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.20	—
Calulu [3]	VZV	240	Commonwealth Govt. Line	300, **600**	P G	—[3]	0.40	—

Remarks.

[1] Operated and controlled by the owners

[3] 2030 to 0030, 0930 to 1030, 1200 to 1300, 1400 to 1430, 1630 to 1730 (ship's time)

[4] 1600 to 1800, 2000 to 0200 (ship's time)

[5] 1000 to 1100, 1200 to 1300, 1400 to 1430 to 1730, 1900 to 2030, 2300 to 0200 (ship's time)

[6] 0700 to 0800, 0930 to 1000, 1200 to 1300, 1400 to 1430, 1630 to 1730, 1900 to 2300 (ship's time)

[7] Steam-tug

[8] For radiotelegrams exchanged with coast stations controlled by Commonwealth of Australia and New Zealand

[9] For radiotelegrams exchanged with coast stations controlled by all other administrations

Canberra[1]	VHO	240	Australian S.S., Ltd.	300, 600	P G ..	—[3]	0.20	—
Carina[3]	VZM	240	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.40	—
Cerebus	VKO	—	Government	600	O ..	—	—	—
Cethana[1]	VXC	—	Commonwealth Govt. Line ..	—	—	—	—	—
Chalamba[1]	VXG	—	Commonwealth Govt. Line ..	—	—	—	—	—
Changsha[1]	CGU	240	G. S. Yuill & Co., Ltd.	300, 600	P G ..	—[3]	0.20	—
Charon[1]	VJM	240	Ocean S.S. Co.	300, 600	P G ..	—[3]	0.20	—
Cockburn Sound Base	VKR	—	Government	600	O ..	—	—	—
Cooee[3]	CGM	240	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.40	—
Coolcha[1]	VXJ	—	Commonwealth Govt. Line ..	—	—	—	—	—
Cooma[1]	VJE	250	Australian S.S., Ltd.	300, 600	P G ..	—[3]	0.20	—
Culburra[1]	VXF	240	Commonwealth Govt. Line ..	300, 600	P G ..	Limited	—	—
Cycle	CGS	240	Australian S.S., Ltd.	300, 600	P G ..	Limited	—	—
Delungra[3]	VXT	250	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.20	—
Dilga[2]	VXE	250	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.20	—
Dimboola[1]	VHL	240	Melbourne S.S. Co.	300, 600	P G ..	—[3]	0.20	—
Dinoga	VXU	250	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.20	—
Dongarra[2]	VJW	250	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.40	—
Dredge No. 3	CGK	200	Government	300, 600	O ..	X	—	—
Dromana[3]	VXP	250	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.20	—
Dumosa[3]	VXV	250	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.20	—
Dundula[3]	VXW	250	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.20	—
Emita[1]	VHG	300	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.20[3] 0.40[3]	—
Enoggera[1]	VXG	300	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.20[3] 0.40[3]	—
Eudunda[1]	CGG	300	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.20[3] 0.40[3]	—
Eurelia[1]	CGF	300	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.20	—
Fantome	GABL	—	Navy	—	—	—	—	—
Fiona[3]	VHQ	240	Colonial Sugar Ref. Co.	300, 600	P G ..	—[3]	0.20	—
Flinders Island Base ..	VKP	—	Government	600	P G ..	—	—	—
Garden Island Base ..	VKQ	—	Government	600	O ..	—	—	—
Geranium	GABM	—	Navy	—	—	—	—	—
Gilgai[3]	VJK	240	Commonwealth Govt. Line ..	300, 600	P G ..	—[3]	0.40	—
Gorgon VKW	VKW	150	Ocean S.S. Co.	300, 600	P G ..	—[3]	0.20	—
Governor Musgrave[3] ..	VZG	150	Lighthouse Dept.	300, 600	P G ..	—[3]	0.20	—
Huon	GABN	—	Navy	—	—	—	—	—
Hwah Ping	VJU	—	Wm. J. L. Lin	300, 600	—	—	—	—
Kaiwarra	GCDY	—	Union S.S. Co.	—	—	—	—	—
Kangaroo	VHM	240	Western Australian Govt. ..	300, 600	P G ..	—[3]	0.20	—
Kanowna[1]	VHD	250	Australian United S.S. Co. ..	300, 600	P G ..	—[3]	0.20	—
Karoola[1]	VHE		McIlwraith, McEacharn Co. ..	300, 600	P G ..	—[3]	0.20	—
Karuah[3]	VZH	150	Lighthouse Dept.	300, 600	P G ..	—[3]	0.20	—
Katoomba[1]	VHN	300	McIlwraith, McEacharn Co. ..	300, 600	P G ..	—[3]	0.20	—
Kowarra[1]	CGS	200	Australian S.S. Ltd.	300, 600	P G ..	—[3]	0.20	—
Kurumba	CGQ	250	Government	—	O ..	X	—	—
Lady Loch[3]	VHS	175	Lighthouse Dept.	300, 600	P G ..	—[3]	0.20	—
Levuka[1]	VHB	250	Australian United S.S. Co. ..	300, 600	P G ..	—[3]	0.20	—
Loongana[1]	VJH	200	Union S.S. Co.	300, 600	P G ..	—[4]	0.20	—
Macedon[1]	CGX	240	Australian S.S. Ltd.	300, 600	P G ..	—[3]	0.20	—
Mackarra[1]	VXX	240	Australian United S.N. Co. ..	300, 600	P G ..	—[3]	0.20	—
Macumba[1]	VXY	240	Australian United S.N. Co. ..	300, 600	P G ..	—[3]	0.20	—
Makambo[1]	VZB	240	Burns, Philp & Co.	300, 600	P G ..	—[3]	0.20	—
Malayan	ESC	—	Burns, Philp & Co.	—	—	—	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
AUSTRALIAN COMMONWEALTH—*contd.*									
Mallow	GABP	—	Navy	—	—	—	—	—	
Marguerite	GABQ	—	Navy	—	—	—	—	—	
Marsina [1]	VKY	240	Burns, Philp & Co.	300, **600**	P G	—[6]	0.20	—	
Mataram VHU	VHU	240	Burns, Philp & Co.	300, **600**	P G	—[3]	0.20	—	
Melusia [1]	CGT	240	Burns, Philp & Co.	300, **600**	P G	—[8]	0.20	—	
Minderoo [1]	VKX	240	Ocean S.S. Co.	300, **600**	P G	—[3]	0.20	—	
Mindini [1]	VJY	240	Burns, Philp & Co.	300, **600**	P G	—[8]	0.20	—	
Montoro [1]	VHT	240	Burns, Philp & Co.	300, **600**	P G	—[5]	0.20	—	
Morinda [1]	VJF	240	Burns, Philp & Co.	300, **600**	P G	[6]	0.20	—	
Navy Office	VKN	—	Government	600	O	—	—	—	
Ooma [1]	VXN	240	William Crosby & Co., Ltd.	300, **600**	P G	—[3]	0.20	—	
Oonah	VXA	200	Union S.S. Co.	300, **600**	P G	—[4]	0.20	—	
Parattah [2]	VKU	200	Commonwealth Govt. Line	300, **600**	P G	—[8]	0.40	—	
Piako	—	—	N. Z. S. Co., Ltd.	—	—	—	—	—	
Platypus	GABT	—	Navy	—	—	—	—	—	
Port Stephens Base	VKS	—	Government	600	O	—	—	—	
Riverina [1]	VJA	250	Huddart Parker, Ltd.	300, **600**	P G	—[8]	0.20	—	
Rona [2]	VXQ	250	Colonial Sugar Ref. Co.	300, **600**	P G	—[3]	0.20	—	
Shandon VXL [2]	VXL	100	Commonwealth Govt. Line	300, **600**	P G	—[8]	0.20	—	
South Africa [1]	VNS	—	Cape Explosives, Ltd.	—	—	—	—	—	
Stalwart	GABW	—	Navy	—	—	—	—	—	
S. George [1]	CGC	300	On Chong & Co.	300, **600**	P G	—[3]	0.20	—	
Submarine J1	GABX	—	Navy	—	—	—	—	—	
Submarine J2	GABY	—	Navy	—	—	—	—	—	
Submarine J3	GABZ	—	Navy	—	—	—	—	—	
Submarine J4	GACB	—	Navy	—	—	—	—	—	
Submarine J5	GACD	—	Navy	—	—	—	—	—	
Submarine J7	GACF	—	Navy	—	—	—	—	—	
Success	GACH	—	Navy	—	—	—	—	—	
Sumatra CGP	CGP	150	Government	300, **600**	P G	X	0.20	—	
Suva [1]	VJI	200	Australian United S.S. Co.	300, **600**	P G	—[8]	0.20	—	
Swordsman	GACK	—	Navy	—	—	—	—	—	
Taiyuan [1]	CGY	240	G. S. Yuill & Co.	300, **600**	P G	—[8]	0.20	—	
Talawa [2]	VXD	200	Commonwealth Govt. Line	300, **600**	P G	—[8]	0.40	—	
Tasmania GACM	GACM	—	Navy	—	—	—	—	—	
Tattoo	GACN	—	Navy	—	—	—	—	—	
Toromeo [2]	CGL	240	Commonwealth Government Line	300, **600**	P G	—[8]	0.40	-	
Ulimaroa [1]	VHY	250	Huddart Parker, Ltd.	300, **600**	P G	—[8]	0.20	-	

Victoria VHX	VHX	[illegible]	W. [illegible] Co., Sydney	[illegible], 600	P G	..	[illegible]	0.40	
Waihemo	[illegible]	300	Union S.S. Co.				—	—	—
Waikawa	GCNY	300	Union S.S. Co.	—			—	—	—
Wandilla [1]	VHI	240	Adelaide S.S. Co.	300, 600	P G	..	—[3]	0.20	—
Warra VKI	VKI	—	Navy	600	O	..	—	—	—
Westralia [1]	VJB	250	Huddart Parker, Ltd.	300, 600	P G	..	—[3]	0.20	—
Winfield	CGR'	—	Adelaide S.S. Co.	300, 600	P G	..	Limited	—	—
Wodonga [1]	VHK	240	Australian United S.S. Co.	300, 600	P G	..	—[3]	0.20	—
Wyandra [1]	VHW	210	Australian United S.S. Co.	300, 600	P G	..	—[3]	0.20	—
Wyola [1]	CGV	150	McIlwraith, McEacharn's Pty., Ltd.	300, 600	P G	..	—[3]	0.20 [3]	0.40 [3]
Wyreema [1]	VJG	200	Australian United S.S. Co.	300, 600	P G	..	—[3]	0.20	—
Yankaiilla	VZN	—	Adelaide S.S. Co.	300, 600	P G	..	Limited	—	—
Zealandia [1]	VJC	240	Huddart Parker, Ltd.	300, 600	P G	..	—[3]	0.20	—
BAHAMAS									
Energie [1]	VRH	200	Scottish Mexican Oil Co.	300, 600	P G	..	X	0.40	—
BELGIUM									
Adolf Deppe [1]	ONF	100-150	Armement Adolf Deppe, Antwerp	300, 600	P G	..	X	0.40	4.00
Albertville [1]	OTV	200	Cie Maritime du Congo	300, 600	P G	..	N	0.40	4.00
Alexandre [1]	ONXA	100-150	Solvay et Cie.	300, 600	P G	..	X	0.40	4.00
Algerie OPI [1]	OPI	100-150	Armement Adolf Deppe	300, 600	P G	..	X	0.40	4.00
Algerier [1]	ONO	150-200	Lloyd Royal Belge	300, 600	P G	..	X	0.40	4.00
Anvers [1]	OOV	100-150	Armement Adolf Deppe	300, 600	P G	..	N	0.40	4.00
Anversoise [1]	OOA	100-150	S.A. Anversoise de Navigation	300, 600	P G	..	N	0.40	4.00
Anversville [1]	ONV	200	Cie Maritime du Congo	300, 600	P G	..	N	0.40	4.00
Argentinier [1]	ORJ	150-200	Lloyd Royal Belge	300, 600	P G	..	X	0.40	4.00
Armistice [1]	ONM	100-150	Armement Adolf Deppe	300, 600	P G	..	N	0.40	4.00
Australier ONU [1]	ONU	150-200	Lloyd Royal Belge (Antwerp)	300, 600	P G	..	N	0.40	4.00
Austurienne [1]	OPU	100-150	Cie Royale Austurienne des Mines	300, 600	P G	..	X	0.40	4.00
Avenir (L') [1]	ONE	170	Assoc. Maritime Belge	300, 450, 600	P G	..	N	0.40	4.00
Baron Baeyens [1]	ONY	100-150	Armement Adolf Deppe	300, 600	P G	..	X	0.40	4.00
Belgier [1]	OOB	150-200	Lloyd Royal Belge (Antwerp)	300, 600	P G	..	N	0.40	4.00
Bolivier [1]	ORV	150-200	Lloyd Royal Belge	300, 600	P G	..	X	0.40	4.00
Brabant ONB [1]	ONB	100-150	Armement Adolf Deppe	300, 600	P G	..	X	0.40	4.00
Caledonier [1]	ONC	150-200	Lloyd Royal Belge (Antwerp)	300, 600	P G	..	N	0.40	4.00
Cambrier [1]	ORO	100-150	Lloyd Royal Belge	300, 600	P G	..	X	0.40	4.00
Colombier	OOC	100-150	Lloyd Royal Belge (Antwerp)	300, 600	P G	..	N	0.40	4.00
Comte de Flandre [1]	OOF	100-150	L. Dens & Co. (London)	300, 600	P G	..	N	0.40	4.00
Danubier [1]	ORN	100-150	Lloyd Royal Belge	300, 600	P G	..	X	0.40	4.00
Delos	OOD	—	—	—	—		—	—	—
Devonier [1]	OOW	150-200	Lloyd Royal Belge	300, 600	P G	..	X [2]	0.40	4.00
Eglantier [1]	OOE	150-200	Lloyd Royal Belge (Antwerp)	300, 600	P G	..	N	0.40	4.00
Elisabeth van België	OTB	100-150	Armement Ad. Deppe	300, 600	P G	..	N	0.40	4.00
Escaut OSE [1]	OSE	100-150	Armement Adolf Deppe	300, 600	P G	..	N	0.40	4.00
Gallier [1]	ONG	150-200	Lloyd Royal Belge (Antwerp)	300, 600	P G	..	N	0.40	4.00
Gantoise [3]	OOG	100-150	S. A. Anversoise de Navigation	300, 600	P G	..	N	0.40	4.00
General Degoutte [1]	OTR	150-200	Soc. Maritime Belge (Ghent)	300, 600	P G	..	N	0.40	4.00
General Leman [4]	ONL	30-40	Government	300, 600	O	..	N	—	—
Gothland [1]	ORG	—	Red Star Line (Antwerp)	—	P G	..	N	0.40	4.00
Gouverneur de Lantsheere [1]	OTG	100-150	Armement Adolf Deppe	300, 600	P G	..	X	0.40	4.00
Grand Remorquer	OSR	20	Government	300, 450, 600	O	..	N	—	—

[1] Operated by the Radio Corporation of America

[1] Operated by the Soc. Anonyme Internationale de Télégraphie Sans fils, Brussels

[2] Ship engaged in Cross-Channel service between Dover and Belgium. Messages exchanged during crossings either between the steamers and Antwerp or Ostend coast stations, or between two of the steamers on this service is applied. The charge per message is 3 frs. per radio telegram of ten words or less, with 20 centimes for each additional word. Messages exchanged with North Foreland station, the ship charge is 10 centimes per word, minimum 1 fr.

[3] Operated and controlled by the owners

[4] Operated by the State Telegraph Administration

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
BELGIUM—*contd.*							Francs.	Francs.	
Grenadier [1]	ORQ	200-250	Lloyd Royal Belge	300, **600**	P G	X	0.40	4.00	
Hastier [1]	ORH	150-200	Lloyd Royal Belge	300, **600**	P G	X	0.40	4.00	
Iberier [1]	OSI	150-200	Lloyd Royal Belge	300, **600**	P G	X	0.40	4.00	
Indier [1]	ONI	150-200	Lloyd Royal Belge (Antwerp)	300, **600**	P G	N	0.40	4.00	
Ionier [1]	OPJ	150-200	Lloyd Royal Belge	300, **600**	P G	X	0.40	4.00	
Italier [1]	OOI	100-150	Lloyd Royal Belge (Antwerp)	300, **600**	P G	N	0.40	4.00	
Jan Breydel	ONJ	100-150	Government	300, **600**	P R [2]	N [2]	—[2]	—[2]	
Kasbek [1]	OOK	—	S.A. d'Armement d'Industrie et de Commerce	—	P G	N	0.40	4.00	
Keltier [1]	OOQ	150-200	Lloyd Royal Belge (Antwerp)	300, **600**	P G	X	0.40	4.00	
Kremlin [1]	ORK	100-150	Soc. Anon. d'Armement, d'Industrie et de Commerce	300, **600**	P G	X	0.40	4.00	
Lapland [1]	ORL	150-200	Red Star Line (Antwerp)	300, 450, **600**	P G	N	0.40	4.00	
Leopold II [1]	OND	100-150	Armement Adolf Deppe	300, **600**	P G	X	0.40	4.00	
Le Rapide	OPR	100-150	Government	300, **600**	P R [2]	N [2]	—[2]	—[2]	
Liége	OTL	100-150	Armement Adolf Deppe	300, **600**	P G	N	0.40	4.00	
Londonier [1]	ONO	180	Lloyd Royal Belge (Antwerp)	300, **600**	P G	N	0.40	4.00	
Madimba [1]	OPX	100-150	Compagnie Africaine de Navigation, Antwerp	300, **600**	P G	X	0.40	4.00	
Memling [1]	ORE	—	Soc. Belge d'Armement Maritime	—	—	—	—	—	
Menapier [1]	OPM	150-200	Lloyd Royal Belge (Antwerp)	300, **600**	P C	N	0.40	4.00	
Nervier [1]	OPN	150-200	Lloyd Royal Belge (Antwerp)	300, **600**	P G	N	0.40	4.00	
Nipponier [1]	ONN	—	Lloyd Royal Belge (Antwerp)	—	P G	N	0.40	4.00	
Northland [1]	ORZ	—	Red Star Line (Antwerp)	—	P G	N	0.40	4.00	
Ougree [1]	ONOA	100-150	Société d'Opérations Maritimes, Antwerp	300, **600**	P G	X	0.40	4.00	
Oural [1]	ORU	50-100	Soc. Anon. d'Armement, d'Industrie et de Commerce	300, **600**	P G	X	0.40	4.00	
Patagonier [1]	ONP	150-200	Lloyd Royal Belge (Antwerp)	300, **600**	P G	N	0.40	4.00	
Pionier [1]	ORP	150-200	Lloyd Royal Belge (Antwerp)	300, **600**	P G	X	0.40	4.00	
Persier [1]	OPS	150-200	Lloyd Royal Belge (Antwerp)	300, **600**	P G	N	0.40	4.00	
Peruvier [1]	OPP	150-200	Lloyd Royal Belge	300, **600**	P G	X	0.40	4.00	
Phoenicier [1]	OOX	100-150	Lloyd Royal Belge	300, **600**	P G	X	0.40	4.00	
Pieter de Coninck	OPK	100-150	Government	300, **600**	P R [2]	N [2]	—[2]	—[2]	
President Bunge [1]	OPB	100-150	Armement Adolf Deppe	300, **600**	P G	X	0.40	4.00	
Princesse Clémentine OOP	OOP	100-150	L. Dens & Cie.	300, **600**	P G	N	0.40	4.00	
Princesse Clémentine OPC	OPC	100-150	Government	300, **600**	P R [2]	N [2]	—[2]	—[2]	

Princesse Elisabeth ..	OPE	100-150	Government	300, 600	P R[2] ..	N[2]	—[2]	—[2]
Republica Argentina[1]	OPG	100-150	Cie. Royale Belge Argentina, Antwerp	300, 600	P G ..	X	0.40	4.00
Rogier[1]	ONR	150-200	Lloyd Royal Belge (Antwerp) ..	300, 600	P G ..	N	0.40	4.00
Roi Albert[1]	ORA	100-150	Armement Adolf Deppe	300, 600	P G ..	N	0.40	4.00
Roumanier[1]	ORR	100-150	Lloyd Royal Belge (Antwerp) ..	300, 600	P G ..	X	0.40	4.00
Samland[1]	ORS	150-200	Soc. Anon. Belgo-Americaine de Navigation	300, 600	P G ..	X	0.40	4.00
Serbier[1]	OOS	100-150	Lloyd Royal Belge (Antwerp) ..	300, 600	P G ..	N	0.40	4.00
Seresia[1]	OTS	100-150	Armement Adolf Deppe	300, 600	P G ..	X	0.40	4.00
Sicilier[1]	ONS	100-150	Lloyd Royal Belge (Antwerp) ..	300, 600	P G ..	N	0.40	4.00
Sierra Belgrano[1] ..	OTZ	150-200	Lloyd Royal Belge	300, 600	P G ..	X	0.40	4.00
Sierra Blanca[1]	OSB	—	S.A. Transoceanique de Transports Paris	—	P G ..	N	0.40	4.00
Sierra de Fuentes[1] ..	OSF	150-200	S.A. Transoceanique de Transports Paris	300, 600	P G ..	X	0.40	4.00
Sierra de Madre[1] ..	OSD	150-200	S.A. Transoceanique de Transports Paris	300, 600	P G ..	X	0.40	4.00
Sierra Grande[1] ..	OSG	—	S.A. Transoceanique de Transports Paris	—	P G ..	N	0.40	4.00
Sierra Leone[1]	OSO	—	S.A. Transoceanique de Transports Paris	—	P G ..	N	0.40	4.00
Sierra Morena[1] ..	OSM	150-200	S.A. Transoceanique de Transports Paris	300, 600	P G ..	X	0.40	4.00
Sierra Negra[1]	OSN	—	S.A. Transoceanique de Transports Paris	—	P G ..	N	0.40	4.00
Sierra Roja[1]	OSJ	—	S.A. Transoceanique de Transports Paris	—	P G ..	N	0.40	4.00
Sierra Quemada[1] ..	OSQ	—	S.A. Transoceanique de Transports Paris	—	P G ..	N	0.40	4.00
Stad Antwerpen ..	OPA	100-150	Government	300, 600	P R[2] ..	N[2]	—[2]	—[2]
Tebea[1]	ONTA	100-150	Association Maritime Belge ..	300, 600	P G ..	X	0.40	4.00
Tigris[1]	ONT	100-150	Armement Adolf Deppe	300, 600	P G ..	X	0.40	4.00
Tongrier[1]	OOT	150-200	Lloyd Royal Belge (Antwerp) ..	300, 600	P G ..	N	0.40	4.00
Trevier[1]	OPT	150-200	Lloyd Royal Belge (Antwerp) ..	300, 600	P G ..	N	0.40	4.00
Tunisie[1]	OTI	100-150	Armement Adolf Deppe	300, 600	P G ..	X	0.40	4.00
Tunisier	OOZ	150-200	Lloyd Royal Belge	300, 600	P G ..	X	0.40	4.00
Ubier[1]	OOU	100-150	Lloyd Royal Belge (Antwerp) ..	300, 600	P G ..	N	0.40	4.00
Ville d'Anvers	OTA	100-150	Government	300, 600	O ..	N	—	—
Ville de Liege	OPL	100-150	Government	300, 600	P R[2] ..	N[2]	—[2]	—[2]
Zinnia[4]	OTN	150	State Navy Administration ..	300, 600	O ..	N	—	—
BERMUDA								
Powerful	VRJ	—	J. S. Darrell & Co.	—	—	—	—	—
BRAZIL								
Acre[1]	SRF	190	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Ada PUY[1]	PUY	120	Cia Brazileira de Cabotagem ..	300, 600	P G ..	N	1.40	—
Alagoas	SNA	60	Navy	300	O[2] ..	—	0.40	—
Alegrete[1]	STX	100	Lage & Bros.	300, 600	P G ..	N	0.40	—
Alfenas[1]	SSS	150	Lage & Bros.	300, 600	P G ..	N	0.40	—
Almirante Jaceguay[1] ..	SRX	190	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Amazonas SOA	SOA	60	Navy	300	O[2] ..	—	0.40	—
Amazonas PNQ[1] ..	PNQ	150	Lloyd Brazileiro, Rio de Janeiro ..	300, 600	P G ..	N	0.40	—
Anna PUA[1]	PUA	150	Empreza Hoepcke	300, 600	P G ..	N	0.40	—

[1] Operated and controlled by the Marconi International Marine Communication Co., Ltd., Rio de Janeiro, Brazil

[2] Operated by the owners

[2] Public correspondence

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
BRAZIL—*contd.*							Francs.	Francs.	
Antonina [1]	PVL	150	Lloyd Nacional	—	P G ..	N	0.40	—	on behalf of the garrison
Aracaju [1]	STY	60	Lage & Bros.	300, **600**	P G ..	N	0.40	—	only
Aracaty [2]	PPB	200	Cia Commercio e Nav.	300, 500, **600**	P G ..	N	0.40	—	[4] Sailing ship
Araguary [2]	PPC	200	Cia Commercio e Nav.	300, 500, **600**	P G ..	N	5.40	—	
Assua [2]	PPD	200	Pereira Carneiro & Co.	300, 500 **600**	P G ..	N	0.40	—	
Atalaia [1]	SSL	100	Lage & Bros.	300, **600**	P G ..	N	0.40	—	
Avaré [2]	SSJ	400	Lloyd Brazileiro	600	P G ..	N	0.40	4.00	
Aymoré [1]	SRJ	190	Lloyd Brazileiro	300, **600**	P G ..	X	04.0	—	
Ayruoca [1]	SSG	60	Lage & Bros.	300, **600**	P G ..	N	0.40	—	
Baependy [1]	SSX	60	Lage & Bros.	300, **600**	P G ..	N	0.40	—	
Bagé [1]	SSU	150	Lage & Bros.	300, **600**	P G ..	N	0.40	—	
Bahia SNB	SNB	150	Navy	**600**	O [3] ..	—	0.40	—	
Bahia SRE [1]	SRE	250	Lloyd Brazileiro	300, **600**	P G ..	N	0.40	—	
Barbacena [1]	PUD	100	Lage & Bros.	300, **600**	P G ..	N	0.40	—	
Barroso	SOB	150	Navy	**600**	O [3] ..	—	0.40	—	
Belem [1]	PVA	150	Lloyd Nacional	300, **600**	P G ..	N	0.40	—	
Belmonte	SOL	—	Navy	—	O [4] ..	—	0.40	4.00	
Benevente [2]	STQ	—	Lloyd Brazileiro	300, **600**	P G ..	N	0.40	4.00	
Benjamin Constant ..	SOC	150	Navy	**600**	O [3] ..	—	0.40	—	
Bocaina [1]	PVR	150	Lloyd Brazileiro	300, **600**	P G ..	N	0.40	—	
Bragança [1]	PVT	150	Lloyd Brazileiro	300, **600**	P G ..	N	0.40	—	
Brazil SRM [1]	SRM	190	Lloyd Brazileiro	300, **600**	P G ..	N	0.40	—	
Brazil PVN [1]	PVN	150	Lloyd Nacional	300, **600**	P G ..	N	0.40	—	
Brazileira [1]	PUV	100	Couto & Cia	300, **600**	P G ..	N	0.40	—	
Cabedello [1]	**PUK**	**100**	**Lage & Bros.**	**300, 600**	**P G** ..	**N**	**0.40**	—	
Campeiro [1]	**PVB**	**150**	**Lloyd Nacional**	**300, 600**	**P G** ..	**N**	**0.40**	—	
Campinas [1]	PVD	90	Lloyd Nacional	300, **600**	P G ..	N	0.40	—	
Campos [2]	STR	200	Lloyd Brazileiro	**600**	P G ..	N	0.40	4.00	
Cannavieiras [1]	PUO	150	Navegacao Bahiana	300, **600**	P G ..	N	0.40	—	
Capivary [2]	PPE	200	Pereira Carneiro & Co.	300, 500, **600**	P G ..	N	0.40	—	
Carlos Gomes	SOE	80	Navy	300	O [3] ..	—	0.40	—	
Caxambu [1]	SSW	100	Lage & Bros.	300, **600**	P G ..	N	0.40	—	
Caxias [2]	SST	400	Lloyd Brazileiro	600	P G ..	N	0.40	—	
Ceara SRD [1]	SRD	250	Lloyd Brazileiro	300, **600**	P G ..	N	0.40	—	
Ceara SNC	SNC	75	Navy	—	O [3] ..	—	0.40	—	
Commandante Belham [1]	SSB	—	Lloyd Brazileiro	300, **600**	P G ..	N	0.40	—	
Commandatuba [1] ..	PUQ	150	Navegacao Bahiana	300, **600**	P G ..	X	0.40	—	
Corrovado PPF [2] ..	PPF	200	Cia Comm. e Nav.	300, 500, **600**	P G ..	N	0.40	—	
Curityba [1]	PUF	150	Lage & Bros.	300, **600**	P G ..	N	0.40	—	

Curvello [8]	SSH	400	Lloyd Brazileiro	600	P G	N	0.40	4.00
Cuyaba [8]	SSN	400	Lloyd Brazileiro	600	P G	N	0.40	4.00
Deodoro	SND	150	Navy	600	O [8]	—	0.40	—
Floriano	SNF	150	Navy	600	O [8]	—	0.40	—
Florianopolis [1]	SRZ	150	Lloyd Brazileiro	300, 600	P G	N	0.40	—
Goyaz [1]	SSC	150	Lloyd Brazileiro	300, 600	P G	N	0.40	—
Guajara [1]	PVU	150	Lloyd Brazileiro, Rio de Janeiro	300, 600	P G	N	0.40	—
Guanabara	PVH	250	Lloyd Nacional	300, 600	P G	N	0.40	—
Guararapes [1]	PUT	150	Navegacao Bahiana	300, 600	P G	N	0.40	—
Guaratuba [1]	PUE	150	Lage & Bros.	300, 600	P G	X	0.40	—
Gurupy [8]	PPG	200	Cia Comm. e Nav.	300, 500, 600	P G	N	0.40	—
Ibiapaba [1]	PVV	150	Lloyd Brazileiro, Rio de Janeiro	300, 600	P G	N	0.40	
Iguassú [1]	STS	100	Lage & Bros.	300, 600	P G	N	0.40	—
Ilheous [1]	PUN	150	Navegacao Bahiana	300, 600	P G	N	0.40	—
Inga [1]	SSK	60	Lage & Bros.	300, 600	P G	N	0.40	—
Iris SRU [1]	SRU	190	Lloyd Brazileiro	300, 600	P G	N	0.40	—
Itabera [1]	STK	250	Cia N. Navegacao Costeira	300, 600	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—
Itagiba [1]	STF	250	Cia N. Navegacao Costeira	300, 600	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—
Itaipava [1]	PPY	950	Cia N. Navegacao Costeira	—	P G	N	0.40	—
Itaituba [1]	PPZ	150	Cia N. Navegacao Costeira	—	P G	N	0.40	—
Itajuba [1]	STG	240	Cia N. Navegacao Costeira	300, 600	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—
Itamaracá [1]	STL	150	Cia N. Navegacao Costeira	300, 600	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—
Itapacy [1]	PPV	150	Cia N. Navegacao Costeira	—	P G	N	0.40	—
Itapema [1]	STH	240	Cia N. Navegacao Costeira	300, 600	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—
Itaperuna [1]	PPX	150	Cia N. Navegacao Costeira	300, 600	P G	N	0.40	—
Itapuca [1]	STI	240	Cia N. Navegacao Costeira	300, 600	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—
Itapuhy [1]	STD	190	Cia N. Navegacao Costeira	300, 600	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—
Itapura [1]	STA	190	Cia N. Navegacao Costeira	300, 600	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—
Itaquera	STE	190	Cia N. Navegacao Costeira	300, 600	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
BRAZIL—*contd.*							Francs.	Francs.	
Itaquatia [1]	PVY	250	Cia N. Navegacao Costeira	300, **600**	P N	N	0.40	—	
Itassucê [1]	STC	190	Cia N. Navegacao Costeira	300, **600**	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—	
Itatinga [1]	STB	190	Cia N. Navegacao Costeira	300, **600**	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—	
Itaúba [1]	STJ	240	Cia N. Navegacao Costeira	300, **600**	P G	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 2000	0.40	—	
Itú [1]	SSF	150	Lage & Bros.	300, **600**	P G	N	0.40	—	
Jaboatao [1]	SSI	150	Lage & Bros.	300, **600**	P G	N	0.40	—	
Jacuby [3]	PPL	200	Cia Comm. e Nav.	300, 500, **600**	P G	N	0.40	—	
Jaguarão	SOJ	30	Navy	100	O [3]	—	0.40	—	
Jaguaribe [3]	PPK	200	Cia Comm. e Nav.	300, 500, **600**	P G	N	0.40	—	
Javary [1]	SRY	150	Lloyd Brazileiro	300, **600**	P G	N	0.40	—	
Jequetinhonha [1]	PUP	150	Navegacao Bahiana	300, **600**	P G	N	0.40	—	
Joazeiro [1]	PUH	100	Lage & Bros.	300, **600**	P G	N	0.40	—	
Jose Bonifacio	SNJ	—	Navy	—	O [3]	—	0.40	4.00	
Lages [1]	PUI	100	Lage & Bros.	300, **600**	P G	N	0.40	—	
Laguna [1]	SRI	150	Lloyd Brazileiro	300, **600**	P G	N	0.40	—	
Laurindo Pitta	SNL	50	Navy	300	O [3]	—	0.40	—	
Leopoldina [1]	SSV	250	Lage & Bros.	300, **600**	P G	N	0.40	—	
Macapa [1]	PUJ	150	Lage & Bros.	300, **600**	P G	N	0.40	—	
Manaos [1]	SRS	150	Lloyd Brazileiro	300, **600**	P G	N	0.40	—	
Mandú [1]	STZ	150	Lage & Bros.	300, **600**	P G	N	0.40	—	
Mantiquera [1]	PVW	150	Lloyd Brazileiro	300, **600**	P G	N	0.40	—	
Marahu [1]	PUR	150	Navegacao Bahiana	300, **600**	P G	N	0.40	—	
Maranguape [3]	PUM	400	Lloyd Brazileiro	300, **600**	P G	N	0.40	4.00	
Maranhao [1]	SRK	190	Lloyd Brazileiro	300, **600**	P G	N	0.40	—	
Marne PVI [1]	PVI	250	Lloyd Nacional	300, **600**	P G	N	0.40	—	
Matto Grosso	SOG	60	Navy	300	O [3]	—	0.40	—	
Mercêdes SRO [1]	SRO	190	Lloyd Brazileiro	300, **600**	P G	N	0.40	—	
Minas Geraes SNM	SNM	450	Navy	**600**	O [3]	—	0.40	—	
Minas Geraes SRB [1]	SRB	250	Lloyd Brazileiro	300, **600**	P G	N	0.40	—	

Mossoro [2]	PPN	200	Cia Comm. e Nav.	300, 500, 600	P G ..	N	0.40	—
Mucury [2]	PPO	200	Cia Comm. e Nav.	300, 500, 600	P G ..	N	0.40	—
Natal PVM [1]	PVM	150	Lloyd Nacional	300, 600	P G ..	N	0.40	—
Neuquen [1]	PVE	120	Lloyd Nacional	300, 600	P G ..	N	0.40	—
Olinda [1]	SRL	190	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Oyapock [1]	SRP	190	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Palmares [2]	PUL	—	Lloyd Brazileiro	—	—	—	—	—
Para SNE	SNE	60	Navy	300	O [2] ..	—	0.40	—
Para SRQ [1]	SRQ	240	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Parahyba	SOP	60	Navy	300	O [2] ..	—	0.40	—
Parana SNH	SNH	60	Navy	300	O [2] ..	—	0.40	—
Parnahyba [1]	STP	60	Lage & Bros.	300, 600	P G ..	N	4.00	—
Pelotas [1]	STV	100	Lage & Bros.	300, 600	P G ..	N	0.40	—
Philadelphia PUU [2] ..	PUU	100	Octacilio Nunes de Souza ..	300, 600	P G ..	X	0.40	4.00
Piauhy	SOY	60	Navy	300	O [2] ..	—	0.40	—
Piave [1]	PVJ	250	Lloyd Nacional	300, 600	P G ..	N	0.40	—
Poconé [2]	SSP	200	Lloyd Brazileiro	600	P G ..	N	0.40	4.00
Porto Seguro [1]	PUS	150	Navegacao Bahiana	300, 600	P G ..	N	0.40	—
Prudente de Moraes ..	SRV	150	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Purus [2]	SSE	200	Lloyd Brazileiro	600	P G ..	N	0.40	4.00
Pyrineus [1]	SSD	150	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Republica SOU ..	SOU	60	Navy	300	O [2] ..	—	0.40	—
Rio Amazonas [1] ..	PVK	250	Lloyd Nacional	300, 600	P G ..	N	0.40	—
Rio de Janeiro SRA [1] ..	SRA	250	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Rio Grande do Norte ..	SNS	60	Navy	300	O [2] ..	—	0.40	—
Rio Grande do Sul ..	SOR	150	Navy	600	O [2] ..	—	0.40	—
Ruy Barboza [1] ..	SRT	190	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Sabara [1]	STT	60	Lage & Bros.	300, 600	P G ..	N	0.40	—
Santa Catherina ..	SNK	60	Navy	300	O [2] ..	—	0.40	—
Santarem [1]	PUC	100	Lage & Bros.	300, 600	P G ..	N	0.40	—
Santos SSY [2]	SSY	150	Lage & Bros.	300, 600	P G ..	N	0.40	—
Sao Paulo SNP ..	SNP	450	Navy	600, 1,200	O [2] ..	—	0.40	—
Sao Paulo SRC [1] ..	SRC	250	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Sargento Albuquerque	SOK	50	Government	300	O [2] ..	—	0.40	—
Satellite [1]	SRG	190	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Sergipe SNO	SNO	60	Navy	300	O [2] ..	—	0.40	—
Sergipe SRH [1]	SRH	190	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Servulo Dourado [1] ..	SRR	190	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Sirio [1]	SRW	190	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Sobral [1]	SSR	150	Lage & Bros.	300, 600	P G ..	N	0.40	—
Sousmarin F.1 ..	SOW	25	Navy	150	O [2] ..	—	0.40	—
Sousmarin F.3 ..	SOX	25	Navy	150	O [2] ..	—	0.40	—
Sousmarin F.5 ..	SOZ	25	Navy	150	O [2] ..	—	0.40	—
Tabatinga [1]	PUB	150	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Tapajoz [1]	PPA	250	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Taquary [2]	PPS	200	Periera Carneiro & Co. ..	300, 500, 600	P G ..	N	0.40	—
Taubaté [1]	STO	100	Lage & Bros.	300, 600	P G ..	N	0.40	—
Therezina [2]	STM	200	Lloyd Brazileiro	600	P G ..	N	0.40	4.00
Tibagy [2]	PPU	200	Cia Comm. e Nav.	300, 500, 600	P G ..	N	0.40	—
Tiradentes	SOT	50	Navy	300	O [2] ..	—	0.40	—
Tocantins [1]	STN	150	Lloyd Brazileiro	300, 600	P G ..	N	0.40	—
Uberaba [2]	SSZ	400	Lloyd Brazileiro	600	P G ..	N	0.40	4.00
Victoria STW [1] ..	STW	100	Lloyd Nacional	300, 600	P G ..	N	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
BRAZIL—*contd.*							Francs.	Francs.	
Wenceslau Braz [1]	SSA	125	Lloyd Brazileiro	300, **600**	P G	N	0.40	—	
Zilka [1]	PUZ	120	Cia Brazileiro de Cabotagem	300, **600**	P G	N	0.40	—	
BRITISH INDIA (See **INDIA**)									
BRITISH WEST INDIES									
Parisian [1]	VRI	200	F. Leyland & Co., Ltd.	300, **600**	P G	N	0.40	—	[1] Operated by the Marconi International Marine Communication Co., Ltd.
CANADA									
Aberdeen VDG [2]	VDG	100	Dept. of Marine	300	O	X	—	—	
Acadia [2]	VDT	200	Dept. of the Naval Service	300, **600**	O	X	—	—	
A. E. McKinstry [1]	CJE	200	Canada S.S. Lines, Ltd.	300, **600**	P R	X	0.40	—	
Alberta VFQ [1]	VFQ	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G	N	0.40	—	
Aleli [2]	VGLP	75	Minister of Lands for British Columbia	300	O	X	—	—	
Algerine [3]	XVQ	250	Pacific Salvage Co.	300, **600**	P G	N	0.20	—	
Alphonse Racine [2]	VGBL	140	W. B. Smith, Bermuda Bunkering Co., Ltd.	—	—	—	—	—	
Arabien [7]	OID	200	Dampskibsselskabet Orient	300, 450, **600**	P G	X	0.40	4.00	
Aranmore [2]	VDQ	200	Department of Marine	300, **600**	O	X	—	—	
Arleux [2]	CFL	—	Department of the Naval Service	—	O	—	—	—	
Armentieres [2]	CFM	—	Department of the Naval Service	—	O	—	—	—	
Arras CFO [2]	CFO	—	Department of the Naval Service	—	O	—	—	—	
Assiniboia [1]	VGI	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G	N	0.40	—	
Athabasca [1]	VGG	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G	N	0.40	—	
Baffin [1]	XVW	200	Mount Royal S.S. Co.	300, **600**	P R	X	0.40	—	
Bayfield [2]	CFA	—	Department of the Naval Service	—	O	—	—	—	
Belchers [1]	XVG	200	Mount Royal S.S. Co.	300, **600**	P R	X	0.40	—	
Bellechasse [2]	VDS	100	Department of Marine	300, **600**	—	X	—	—	
Bessie Dollar [1]	VFO	200	Dollar S.S. Lines, Ltd.	300, **600**	P G	N	0.40	—	
[illegible] Heath [1]	CJO	150	Steam Nav. Co. of Canada, Ltd.	300, **600**	P R	X	0.40	—	
[illegible]	VFZ	200	Union S.S. Company	300, **600**	P G	N	0.40	—	
[illegible] VDC [2]	VDC	—	Department of the Naval Service	—	O	—	—		
Canadian Adventurer [1]	[illegible]	250	[illegible]	[illegible]	[illegible]	X	—		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

[1] Operated by the Marconi Wireless Telegraph Co. of Canada, Ltd., Montreal, P.Q.
[2] Operated by the owner
[3] Shipowners, Radio Service, Inc.
[4] Operated by the Cutting and Washington Radio Corporation, 6 and 8, West 48th Street, New York
[5] When the ship is trading in the Pacific Coast Service
[6] When the ship is trading in the Atlantic Coast Service

Canadian Beaver ..	XWY	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Carrier [1] ..	VGKM	250	Canadian National Railways, Montreal	300, 600	P R	..	X	0.40	—
Canadian Conqueror [1] ..	VGLX	250	Canadian National Railways, Montreal	300, 600	P R	..	X	0.40	—
Canadian Exporter [1] ..	XWR	250	Canadan National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Farmer [1] ..	XWX	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Fisher [1] ..	VGBM	250	Canadian Government Merchant Marine, Ltd.	300, 600	P G	..	N	0.40	—
Canadian Gunner [1] ..	XWE	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Highlander [1]	VGDC	250	Canadian National Railways, Montreal	300, 600	P R	..	X	0.40	—
Canadian Hunter [1] ..	VGBX	300	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Importer [1] ..	XWQ	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Inventor [1] ..	XWT	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Mariner [1] ..	VGBF	250	Canadian Government Merchant Marine, Ltd.	300, 600	P G	..	X	0.40	—
Canadian Miller [1] ..	XYZ	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Miner [1] ..	XWV	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Navigator [1] ..	XWJ	300	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Observer [1] ..	VGLB	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Otter [1] ..	VGLF	200	Canadian National Railways, Montreal	300, 600	P R	..	X	0.40	—
Canadian Pioneer [1] ..	CKT	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Planter [1] ..	XWP	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Prospector [1]	XWU	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Raider [1] ..	XWN	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Rancher [1] ..	XWO	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Ranger [1] ..	XVF	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Recruit [1] ..	XVK	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Rover [1] ..	VGDZ	200	Canadian Government Merchant Marine, Ltd.	300, 600	P R	..	X	0.40	—
Canadian Runner [1] ..	VGDT	75	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Sailor [1] ..	XVR	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Sapper [1] ..	VGBK	200	Canadian Government Merchant Marine, Ltd.	300, 600	P R	..	X	0.40	—
Canadian Sealer [1] ..	XWK	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Seigneur ..	XVS	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Settler ..	XWI	150	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Signaller [1] ..	XVU	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Sower [1] ..	XWH	150	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Spinner [1] ..	XWM	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Squatter [1] ..	VGJT	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Trader [1] ..	XVP	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Trapper ..	VGNC	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Traveller [1] ..	VGBC	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Trooper [1] ..	XYN	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Victor [1] ..	VGBP	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Volunteer [1] ..	XVM	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Voyageur [1] ..	CKS	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Warrior [1] ..	XVA	200	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadian Winner [1] ..	VGDB	250	Canadian National Railways ..	300, 600	P R	..	X	0.40	—
Canadienne (La) [2] ..	XWS	150	Atlantic Salvage Co.	300, 600	P R	..	X	0.40	—
Canora [1]	CKD	200	Canadian Northern S.S., Ltd. ..	300, 600	P G	..	N	0.40	—
Cape Trinity [1] ..	VEF	100	Canada S.S. Lines, Ltd.	300, 600	P G	..	N	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
CANADA—*contd.*									
Cartier [2]	CFB	200	Department of the Naval Service	300, **600**	O	X	—	—	
Cayuga VEL [1]	VEL	100	Canada S.S. Lines, Ltd	300, **600**	P G	N	0.40	—	
Charlton [1]	VEX	100	Victoria Harbour Lumber Co.	300, **600**	P R	X	0.40	—	
Chelohsin [2]	VGN	200	Union S.S. Co.	300, **600**	P G	N	0.40	—	
Chippewa [1]	VEH	100	Canada S.S. Lines, Ltd.	300, **600**	P G	N	0.40	—	
City of Vancouver [2]	VGBD	250	J. Coughlan & Sons	300, **600**	P R	X	0.40	—	
City of Victoria [2]	VGNT	250	J. Coughlan & Sons	300, **600**	P R	X	0.40	—	
Collingwood CKP [1]	CKP	100	Canada S.S. Lines, Ltd.	300, **600**	P R	X	0.40	—	
Corono [1]	VEB	100	Canada S.S. Lines, Ltd.	300, **600**	P G	N	0.40	—	
Cote Nord [2]	XWZ	300	North-East Co., Ltd.	300, **600**	P R	X	0.40	—	
Dalhousie City [1]	VEA	100	Niagara, St. Catharines and Toronto Nav. Co.	300, **600**	P G	N	0.40	—	
Dollard [2]	VDO	150	Department of Marine	300	O	X	—	—	
Druid [2]	VDH	100	Department of Marine	300, **600**	O	X	—	—	
E. B. Osler [1]	CKE	150	Canada S.S. Lines, Ltd.	300, **600**	P R	X	0.40	—	
E. D. Kingsley [2]	XWL	300	Kingsley Navigation Co.	300, **600**	P G	N	0.40	—	
Emperor [1]	CKF	150	Canada S.S. Line, Ltd.	300, **600**	P R	X	0.40	—	
Empire VEP [1]	VEP	150	Canadian Towing and Wrecking Co., Ltd.	300, **600**	P R	X	0.40	—	
Empress of Asia [1]	CJI	300	Canadian Pacific Railway S.S. Co.	300, **600**	P G	N	0.40	—	
Empress of Japan [1]	CJG	250	Canadian Pacific Railway S.S. Co.	300, **600**	P G	N	0.40	—	
Empress of Russia [1]	CJH	300	Canadian Pacific Railway S.S. Co.	300, **600**	P G	N	0.40	—	
Estevan [2]	VDN	200	Department of Marine	300, **600**	O	X	0.40	—	
Eunice B [2]	VGFS	75	Minister of Lands for British Columbia	300	O	X	—	—	
Eva R [2]	VGNP	75	Minister of Lands for British Columbia	300	O	X	—	—	
Festubert [2]	CKR	—	Department of the Naval Service	—	O	—	—	—	
Givenchy [1]	CFN	—	Department of the Naval Service	—	O	—	—	—	
Glenfinnan [1]	VBL	125	Great Lakes Transportation Co.	300, **600**	P R	X	0.40	—	
Glenislas [1]	CKB	300	Great Lakes Transportation Co.	300, **600**	P G	N	0.40	—	
Glenlyon VBJ [1]	VBJ	200	Great Lakes Transportation Co.	300, **600**	P R	X	0.40	—	
Glenmavis [1]	CJL	100	Great Lakes Transportation Co.	300, **600**	P R	X	0.40	—	
Glenorchy XVB [1]	XVB	200	Great Lakes Transportation Co.	300, **600**	P R	X	0.40	—	
Glensbee [1]	VEW	200	Great Lakes Transportation Co.	300, **600**	P R	X	0.40	—	
G. R. Crowe [1]	VET	100	Montezuma Transportation Co., Ltd.	300, **600**	P R	X	0.40	—	
Grilse [2]	GCAB	—	Department of the Naval Service	—	O	—	—	—	
Guiana [1]	CJJ	250	Canada S.S. Lines, Ltd.	300, **600**	P G	N	0.40	—	

Gulnare [2]	VBZ	—	Department of the Naval Service	—	O ..	—	—	—
Hamonic [1]	VGD	200	Northern Navigation Co., Ltd. ..	300, 600	P G ..	N	0.40	—
Harold Dollar [1] ..	VCY	200	Dollar S.S. Lines, Ltd.	300, 600	P G ..	N	0.40	—
Harrison [1]	VFY	100	John Harrison & Sons Co., Ltd.	300, 600	P R ..	X	0.10	—
Hochelaga CHR [1] ..	CHR	200	Dominion Iron & Steel Co. ..	300, 600	P R ..	X	0.40	—
Hochelaga VBV [2] ..	VBV	—	Department of the Naval Service	—	O ..	—	—	—
Huronic [1]	VGE	200	Northern Navigation Co., Ltd. ..	300, 600	P G ..	N	0.40	—
Imperoyal [1]	VGM	150	Imperial Oil Co.	300, 600	P R ..	X	0.40	—
Impoco	CJN	100	Imperial Oil Co.	300, 600	P R ..	X	0.40	—
Iocolite [1]	VBS	200	Imperial Oil Co.	300, 600	P R ..	X	0.40	—
Iperia [2]	VAM	150	Iperia Ship Corporation, Ltd. ..	300, 600	P R ..	X	0.40	—
Iver Heath [1]	XWB	250	Bishop Navigation Co., Ltd. ..	300, 600	P R ..	X	0.40	—
J. A. McKee [1]	CHX	200	Canada S.S. Lines, Ltd... ..	300, 600	P R ..	X	0.40	—
J. H. G. Haggarty [1]	CKG	200	Canada S.S. Lines, Ltd... ..	300, 600	P R ..	X	0.40	—
Julius Kessler [4] ..	VGBS	100	Sugar Products Co. ..	300, 600	P R ..	X	0.40	—
Keewatin [1]	VGC	200	Canadian Pacific Railway S.S. Co.	300, 600	P G ..	N	0.40	—
Kingston [1]	VEC	100	Canada S.S. Lines, Ltd... ..	300, 600	P G ..	N	0.40	—
Kiora [2]	VGCK	75	Minister of Lands for British Columbia	300	O ..	X	—	—
Korono [1]	CJP	200	Canada S.S. Lines, Ltd... ..	300, 600	P G ..	N	0.40	—
Lady Evelyn [2]	VDX	100	Post Office Department	300, 600	O ..	X	—	—
Lady Grey [2]	VDL	100	Department of Marine	300	O ..	X	—	—
Lady Laurier [2]	VDF	150	Department of Marine	300	O ..	X	—	—
Laketon [1]	CHO	150	Mathews S.S. Co.	300, 600	P R ..	X	0.40	—
Laurentian [2]	CFC	—	Department of Marine	—	O ..	—	—	—
Lingan [2]	CHQ	200	Dominion Coal, Co., Ltd. ..	300, 600	P G ..	N	0.40	—
L. J. Skinner [2]	VGJR	75	Minister of Lands for British Columbia	300	O ..	X	—	—
Loos CFQ [2]	CFQ	—	Department of the Naval Service	—	O ..	—	—	—
Lord Dufferin [1]	CJQ	200	Canada S.S. Lines, Ltd... ..	300, 600	P R ..	N	0.40	—
Lord Ormonde [1]	VGLR	150	Ocean S.S. Co.	300, 600	P R ..	X	0.40	—
Lord Strathcona VFX [1] ..	VFX	100	Quebec Salvage & Wrecking Co., Ltd.	300, 600	P G ..	N	0.40	—
Lucknowa [1]	XVD	100	Midland Transportation Co. ..	300, 600	P R ..	X	0.40	—
Macassa [1]	VEK	100	Canada S.S. Lines, Ltd. ..	300, 600	P G ..	N	0.40	—
Malaspina [2]	VDU	—	Department of the Naval Service	—	O ..	—	—	—
Manitoba [1]	VGH	200	Canadian Pacific Railway S.S. Co.	300, 600	P G ..	N	0.40	—
Maplecourt [1]	VGFB	250	Canada S.S. Lines, Ltd. ..	300, 600	P R ..	X	0.40	—
Mapledawn [1]	VGDN	250	Montreal Transportation Co., Ltd.	300, 600	P R ..	X	0.40	—
Mapledean [1]	VGDJ	150	Canada S.S. Lines, Ltd. ..	300, 600	P R ..	X	0.40	—
Margaret VDW [2] ..	VDW	200	Department of Customs	300, 600	O ..	X	—	—
Margaret Coughlan [2] ..	VGCD	250	J. Coughlan & Sons	300, 600	P R ..	X	0.40	—
Mariska [1]	XVL	150	Trans-Atlantic S.S. Co.	300, 600	P R ..	X	0.40	—
Martian [1]	CKH	150	Canada S.S. Lines, Ltd. ..	300, 600	P R ..	X	0.40	—
Melville Dollar [1] ..	VEE	200	Dollar S.S. Lines, Ltd.	300, 600	P G ..	N	0.40	—
Messines [2]	CKV	—	Department of the Naval Service	—	O ..	—	—	—
Midland King [1] ..	CKI	150	Canada S.S. Lines, Ltd. ..	300, 600	P R ..	X	0.40	—
Midland Prince [1] ..	CKJ	150	Canada S.S. Lines, Ltd. ..	300, 600	P R ..	X	0.40	—
Mina Brea [1]	VAP	150	International Petroleum Co., Ltd.	300, 600	P R ..	X	0.40	—
Modjeska [1]	CHU	250	Canada S.S. Lines, Ltd. ..	300, 600	P G ..	X	0.40	—
Montcalm VDJ [2] ..	VDJ	150	Department of Marine	300, 600	O ..	X	—	—
Monteagle [1]	CJV	200	Canadian Pacific Railway S.S. Co.	300, 600	P G ..	N	0.40	—
Montreal [1]	VCW	100	Canada S.S. Lines, Ltd. ..	300, 600	P G ..	N	0.40	—
Newington [2]	VDP	100	Department of Marine	300	O ..	X	—	—

Ship Stations—*Continued.*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
CANADA—*contd.*							Francs.	Francs.	
Newona [2]	CJW	100	Fraser, Brace & Clarke, Ltd. ..	300, **600**	P G ..	N	0.40	—	
Niobe VDA [2]	VDA	—	Department of the Naval Service	—	O ..	—	—	—	
Noronic [1]	VGW	200	Northern Navigation Co., Ltd. ..	300, **600**	P G ..	N	0.40	—	
Northumberland VGDL[1]	VGDL	125	Niagara, St. Catherines & Toronto Navigation Co.	300, **600**	P G ..	X	0.40	—	
Ontario No. 1 [2] ..	VGU	200	Ontario Car Ferry Co., Ltd. ..	300, **600**	P G ..	N	0.10	—	
Ontario No. 2 [2] ..	VER	200	Ontario Car Ferry Co., Ltd. ..	300, **600**	P G ..	N	0.10	—	
Ormes [1]	VGFW	350	Donald S.S. Co.	300, **600**	P R ..	X	0.40	—	
Paipoonge [1]	VGBJ	200	C. A. Barnard, K.C.	300, **600**	P R ..	X	0.40	—	
Parima [1]	CJX	250	Canada S.S. Lines, Ltd. ..	300, **600**	P G ..	N	0.40	—	
Pinta [2]	CJS	100	Navy League of Canada.. ..	300, **600**	P R ..	X	0.10	—	
Prince Albert [2] ..	VFL	100	Grand Trunk Pacific Coast S.S. Co.	300, **600**	P G ..	N	0.40	—	
Prince Arthur [1] ..	VGJ	200	Boston & Yarmouth S.S. Co., Ltd.	300, **600**	P G ..	N	0.40	—	
Prince George VGK [1]..	VGK	200	Boston & Yarmouth S.S. Co., Ltd.	300, **600**	P G ..	N	0.40	—	
Prince John [2]	VFM	100	Grand Trunk Pacific Coast S.S. Co.	300, **600**	P G ..	N	0.40	—	
Princess Adelaide [1] ..	VFA	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G ..	N	0.40	—	
Princess Alice [1] ..	VFD	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G ..	N	0.40	—	
Princess Beatrice [1] ..	VFC	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G ..	N	0.40	—	
Princess Charlotte [1] ..	VFE	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G ..	N	0.40	—	
Princess Ena VFJ [1] ..	VFJ	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G ..	N	0.40	—	
Princess Maquinna [1] ..	VGT	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G ..	N	0.40	—	
Princess Mary [1] ..	VFB	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G ..	N	0.40	—	
Princess May [1].. ..	VFH	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G ..	N	0.40	—	
Princess Patricia [2] ..	VGZ	100	Canadian Pacific Railway B.C. Coast S.S. Co.	300, **600**	P G ..	N	0.40	—	
Princess Royal VFG [1]..	VFG	200	Canadian Pacific Railway S.S. Co.	300, **600**	P G ..	N	0.40	—	
Quebec [1]	XVE	100	Canada S.S. Lines, Ltd. ..	300, **600**	P G ..	N	0.40	—	
Rainbow VDB [2] ..	VDB	—	Department of the Naval Service	—	O ..	—	—	—	
Rapids King [1] ..	VEG	125	Canada S.S. Lines, Ltd. ..	300, **600**	P G ..	N	0.40	—	
Reginald [1]	VEY	100	Victoria Harbour Lumber Co. ..	300, **600**	P R ..	X	0.40	—	
Reginolite [1]	CHW	200	Imperial Oil Co.	300, **600**	P G ..	N	0.40	—	
Reliance [1]	VGKJ	250	Lake Superior Paper Co. ..	300, **600**	P R ..	X	0.40	—	
Renvoyle [1]	CJY	50	Canada S.S. Lines, Ltd. ..	300, **600**	P R ..	X	0.40	—	
Riverton VBI [1] ..	VBI	250	Matthews S.S. Co.	300, **600**	P R ..	X	0.40	—	
Royalite [1]	VBQ	200	Imperial Oil Co.	300, **600**	P R ..	X	0.40	—	
Sable I [1]	XVV	250	James A. Farquhar & Co... ..	300, **600**	P G ..	N	0.40	—	
Saguenay [1]	VBP	150	Canada S.S. Lines, Ltd. ..	300, **600**	P G ..	N	0.40	—	
Sarnian [1]	VGJC	250	Canada S.S. Lines, Ltd. ..	300, **600**	P R ..	X	0.40	—	

Sarnolite [1]	VBR	200	Imperial Oil Co.	300, 600	P G	N	0.40	—
Saskatoon [2]	VGCP	150	Ernest John Heinz, Paris	300, 600	P R	X	0.40	—
Schoolcraft [1]	VAU	200	Manly Chow, Esq.	300, 600	P R	X	0.40	—
Shearwater [2]	GCED	—	Department of the Naval Service	—	O	—	—	—
Sheba [2]	VDZ	200	Department of Railways & Canals	300, 600	O	X	—	—
Stadacona VBU [2]	VBU	—	Department of the Naval Service	300, 600	O	X	—	—
Stanley VDE [2]	VDE	150	Department of Marine	300, 600	O	X	—	—
S. Eloi CKY [2]	CKY	—	Department of the Naval Service	—	O	—	—	—
S. Julien [2]	CKZ	—	Department of the Naval Service	—	O	—	—	—
Talaralite [1]	CJK	200	International Petroleum Co., Ltd.	300, 600	P G	N	0.40	—
Tees [1]	VFK	200	Canadian Pacific Railway S.S. Co.	300, 600	P G	N	0.40	—
Thiepval [2]	CFP	—	Department of the Naval Service	300, 600	P R	X	0.40	—
Thomas Drummond [2]	CHY	200	Department of Railways & Canals	300, 600	P G	N	0.20	—
Toronto VED [1]	VED	100	Canada S.S. Lines	300, 600	P G	N	0.40	—
Tug Lorne [2]	CJC	100	Grand Trunk Pacific Coast S.S. Co.	300, 600	P G	N	0.20	—
Turret Cape [1]	CHV	200	Dominion Iron & Steel Co.	300, 600	P G	—	0.40	—
Turret Court [1]	CHZ	200	Dominion Iron & Steel Co.	—	—	—	—	—
Turret Crown [2]	XVX	200	Universal Transport Co.	300, 600	P G	N	0.20 [5] 0.40 [6]	—
Tyrian VDK [2]	VDK	150	Department of Public Works	300, 600	O	X	—	—
Valcartier [1]	XWW	150	Montreal Transportation Co.	300, 600	P R	X	0.40	—
Vaudreuil [1]	XVY	150	C. A. Barnard	300, 600	P R	X	0.40	—
Venture [2]	VGX	200	Union S.S. Co.	300, 600	P G	N	0.40	—
Vimy [2]	CKX	—	Department of the Naval Service	—	O	—	—	—
Volunda [1]	VGCS	250	Nova Scotia Steel & Coal Co.	300, 600	P R	X	0.40	—
Watuka [1]	CKU	150	Wasis S.S. Co., Ltd.	300, 600	P R	X	0.40	—
W. D. Matthews [1]	CKK	150	Canada S.S. Lines, Ltd.	300, 600	P R	X	0.40	—
Westmount XVI [1]	XVI	150	Montreal Transportation Co.	300, 600	P R	X	0.40	—
Wethersfield [1]	CHP	150	The Canadian Maritime Co., Ltd.	—	—	—	—	—
W. Grant Morden [1]	CKL	150	Canada Interlake Line, Ltd.	300, 600	P R	X	0.40	—
Ypres [2]	CKW	—	Department of the Naval Service	—	O	—	—	—
CHILE								
Aguila CBU	CBU	—	Navy	—	—	—	—	—
America CDW	CDW	250	—	300, 600	P G	—	—	—
Angamos	CAN	—	—	—	O	—	—	—
Arauco	CDU	250	—	300, 600	P G	—	—	—
Aysen [1]	CDB	150	Compania Sud-Amer. de Vapores	300, 600	P G	N	0.40	4.00
Baquedano	CAK	—	Navy	—	O	—	—	—
Blancho	CAH	—	Navy	—	O	—	—	—
Cachapoal	CDF	200	Compania Sud-Amer. de Vapores	300, 600	P G	X	0.40	4.00
Calera	CDV	250	—	300, 600	P G	—	—	—
Caupolican	CDJ	250	—	300, 600	P G	—	—	—
Chacabuco	CAG	—	Navy	—	O	—	—	—
Chiloe	CDP	—	—	300, 600	P G	—	—	—
Colocolo	CBW	—	Navy	—	—	—	—	—
Condell	CBB	—	Navy	—	O	—	—	—
Elicura	CBX	—	Navy	—	—	—	—	—
Errazuriz	CAJ	—	Navy	—	O	—	—	—
Esmeralda	CAF	—	Navy	—	O	—	—	—
Florencia	CDT	250	—	300, 600	P G	—	—	—
H.1	CAU	—	Navy	—	—	—	—	—
H.2 CAV	CAV	—	Navy	—	—	—	—	—

[1] Operated by the Marconi International Marine Communication Co., Ltd., London

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
CHILE—*contd.*							Francs.	Francs.	
H.3 CAW	CAW	—	Navy	—	—	—	—	—	
H.4 CAX	CAX	—	Navy	—	—	—	—	—	
H.5 CAY	CAY	—	Navy	—	—	—	—	—	
H.6 CAZ	CAZ	—	Navy	—	—	—	—	—	
Huasco [1]	CDC	150	Compania Sud-Amer. de Vapores	300, **600**	P G	N	0.40	4.00	
Imperial [1]	CDE	150	Compania Sud-Amer. de Vapores	300, **600**	P G	N	0.40	4.00	
Iquique	CDS	250	—	300, **600**	P G	—	—	—	
Itata	CDN	250	—	300, **600**	P G	—	—	—	
Latorre CAA	CAA	—	—	—	O	—	—	—	
Lautaro CAO	CAO	—	Navy	—	—	—	—	—	
Lautaro CDM	CDM	250	—	300, **600**	P G	—	—	—	
Leucoton	CBV	—	Navy	—	—	—	—	—	
Lynch	CBA	—	Navy	—	O	—	—	—	
Magallanes	CDQ	250	—	300, **600**	P G	—	—	—	
Maipo CAM	CAM	—	Navy	—	O	—	—	—	
Maipo CDH	CDH	200	Compania Sud-Amer. de Vapores	300, **600**	P G	X	0.40	4.00	
Mapocho	CDG	200	Compania Sud-Amer. de Vapores	300, **600**	P G	X	0.40	4.00	
M. Gamero	CBR	—	Navy	—	—	—	—	—	
M. Jarpa	CBM	—	Navy	—	—	—	—	—	
O'Brien CBN	CBN	—	Navy	—	O	—	—	—	
O'Higgins	CAE	—	Navy	—	O	—	—	—	
Orella	CBQ	—	Navy	—	O	—	—	—	
Orompello CBY	CBY	—	Navy	—	—	—	—	—	
Orompello CDL	CDL	250	—	300, **600**	P G	—	—	—	
Palena [1]	CDD	150	Compania Sud-Amer. de Vapores	300, **600**	P G	N	0.40	4.00	
Pisagua	CDK	250	—	300, **600**	P G	—	—	—	
Prat	CAD	—	Navy	—	O	—	—	—	
P. Sibbald	CBZ	—	Navy	—	—	—	—	—	
Quito CDO	CDO	250	—	300, **600**	P G	—	—	—	
Rancagua	CAL	—	Government	—	O	—	—	—	
Renaico	CDA	150	—	300, **600**	P G	—	—	—	
Riquelme	CBP	—	Navy	—	O	—	—	—	
Riveros	CBD	—	—	—	O	—	—	—	
Serrano	CBO	—	Navy	—	O	—	—	—	
Taltal	CDR	250	—	300, **600**	P G	—	—	—	
Thompson CBL	CBL	—	Navy	—	O	—	—	—	
Uribe	CBE	—	—	—	O	—	—	—	
Williams CBC	CBC	—	—	—	O	—	—	—	
Zenteno	CAI	—	Navy	—	O	—	—	—	

CHINA									
Chao-Ho	XNW	—	Navy	—	O ..	—	—	—	
Chu-Chien	XON	—	Navy	—	O ..	—	—	—	
Chu-Kwan	XOG	—	Navy	—	O ..	—	—	—	
Chu-Tai	XOA	—	Navy	—	O ..	—	—	—	
Chu-Tung	XOD	—	Navy	—	O ..	—	—	—	
Chu-Yew	XOY	—	Navy	—	O ..	—	—	—	
Chu-Yu	XOU	—	Navy	—	O ..	—	—	—	
Fei-Ying	XPS	—	Navy	—	O ..	—	—	—	
Foo-An	XNL	—	Navy	—	O ..	—	—	—	
Hai-Chew	XSW	—	Navy	—	O ..	—	—	—	
Hai-Chi	XSC	—	Navy	—	O ..	—	—	—	
Hai-Shen	ZSP	—	Navy	—	O ..	—	—	—	
Hai-Yung	XSY	—	Navy	—	O ..	—	—	—	
Hao-Kia	XSI	—	—	—	—	—	—	—	
Hao-Ou..	XSM	—	—	—	—	—	—	—	
Hao-Pine	XSK	—	—	—	—	—	—	—	
Hao-Tine	XSL	—	—	—	—	—	—	—	
Hao Y	XSJ	—	—	—	—	—	—	—	
Kiang-Chien	XQC	—	Navy	—	O ..	—	—	—	
Kiang-Han	XQH	—	Navy	—	O ..	—	—	—	
Kiang-Li	XQR	—	Navy	—	O ..	—	—	—	
Kiang-Yuen	XQU	—	Navy	—	O ..	—	—	—	
Kien-An..	XPN	—	Navy	—	O ..	—	—	—	
Kien-Kong	XPO	—	Navy	—	O ..	—	—	—	
Kien-Wei	XPW	—	Navy	—	O ..	—	—	—	
King Ching	XQW	—	Navy	—	O ..	—	—	—	
Lien-Chin	XRC	—	Navy	—	O ..	—	—	—	
Nan-Shen	XNS	—	Navy	—	O ..	—	—	—	
Tung-An	XNB	—	Navy	—	O ..	—	—	—	
Tung-Chi	XPF	—	Navy	—	O ..	—	—	—	
Ying Swei	XSF	—	Navy	—	O ..	—	—	—	
Yu-Chang	XNO	—	Navy	—	O ..	—	—	—	
Yung-Chion	XNG	—	Navy	—	O ..	—	—	—	
Yung-Fung	XNF	—	Navy	—	O ..	—	—	—	
Yung-Kien	XNY	—	Navy	—	O ..	—	—	—	
Yung Tsih	XNC	—	Navy	—	O ..	—	—	—	
CUBA									
Olinda	XA	—	Compania Maritima Cubana ..	—	P G ..	—	—	—	
Paloma	XB	—	Compania Maritima Cubana ..	—	P G ..	—	—	—	
CZECHO-SLOVAKIA									
Legie	OKA	300	Bainque Legionaires	300, **600**	P G ..	Night	0.40	—	
DANZIG (Free Town of)									
Adolf Sommerfeld [1] ..	DTA	200	Reederei Behnke und Siez ..	300, **600**, 800	P R [1] ..	X	0.40	4.00	[1] Operated by the owner; the accounts are settled by the Deutsche
Artus [1]	DTC	200	Artus Danziger Reederei-und Handels-Aktiengesellschaft	300, **600**	P G ..	X	0.40	4.00	
Baltic DTB [1]	DTB	200	Baltisch-Amerikanische Petroleum-Import-Gesellschaft m.b.H.	300, **600**	P G ..	0800 to 0900 1900 to 2000	0.40	4.00	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
DANZIG contd.							Francs.	Francs.	
Danzig [1]	DTD	200	Artus Danziger Reederei-und Handels-Aktiengesellschaft	300, **600**	P G ..	X	0.40	4.00	Betriebsgesellschaft für drahtlose Telegraphie, Berlin
Flora Sommerfeld ..	DTF	200	Reederei Behnke und Sieg ..	300, **600**, 800	P R [2] ..	X	0.40	4.00	[2] Correspondence limited to radiotelegrams exchanged with Reederei Behnke und Sieg or with their agents in different ports
Gedania [1]	DTG	200	Baltisch-Amerikanische Petroleum-Import-Gesellschaft, m.b.H.	300, **600**	P G ..	0800 to 0900 1900 to 2000	0.40	4.00	
Vistula [1]	DTV	200	Baltisch-Amerikanische Petroleum-Import-Gesellschaft m.b.H.	300, **600**	P G ..	0800 to 0900 1900 to 2000	0.40	4.00	
Zoppot [1]	DTZ	200	Baltisch-Amerikanische Petroleum-Import-Gesellschaft m.b.H.	300, **600**	P G ..	0800 to 0900 1900 to 2000	0.40	4.00	
DENMARK									
Aalborg [7]	OHH	200	Rederiet Rechnitzer, Thomsen & Co.	300, 450, **600**	P G ..	X	0.40	4.00	
Absalon	OUA	—	Navy	**600**	O [5] ..	X	—	—	
Aegir	OVK	—	Navy	**600**	O [5] ..	X	—	—	
Afrika [3]	OXO	300	Det Ostasiatiske Co.	300, 450, **600**	P ..	X	—[4]	—[4]	
Aggersund [7]	OHC	200	Dampskibsselskabet Gylfe ..	300, 450, **600**	P G ..	X	0.40	4.00	
Alexandra OGX [7] ..	OGX	160	Det Forenede Dampskibsselskab	300, 450, **600**	P G ..	X	0.40	4.00	
Alssund [3]	OXX	350	Gylie Co.	300, **600**	P G ..	X	—	—	
Amalienborg [7]	OHCA	350	Dampskibsselskabet Dannebrog ..	300, 450, **600**, 800	P G ..	X	0.40	4.00	
Anden April	OVA	—	Navy	**600**	O [5] ..	X	—	—	
Annam [3]	OZN	160	Det Ostasiatiske Co.	300, **600**	P ..	X	—[4]	—[4]	
A. P. Bernstorff [1] ..	OYN	150	Det Forenede Damp. A.S. Copenhagen	300, **600**	P G ..	X	0.40	4.00	
Arkansas OIF [7] ..	OIF	200	Det Forenede Dampskibsselskab	300, 450, **600**	P G ..	X	0.40	4.00	
Arnold Moersk [3] ..	OZS	200	S.A. Dampskibsselskabel af 1912	300, **600**	P G ..	X	—[4]	—[4]	
Asia [3]	OYR	160	Det Ostasiatiske Co.	300, 450, **600**	P G ..	X	—[4]	—[4]	
Astrid [3]	OZB	150	Det Danske Petroleums-Atkies ..	300, **600**	P G ..	X	—	—	
Atlantic OIH [3] ..	OIH	250	Det Oversöiske Compagnie ..	300, 450, **600**	P ..	X	—[4]	—[4]	
Australien [3]	OZR	160	Det Ostasiatiske Co.	300, 450, **600**	P ..	X	—[4]	—[4]	
Bellona OWA	OWA	—	Navy	**600**	O [5] ..	X	—	—	
Berlin OIX [7]	OIX	150	Dampskibsselskabet Patria ..	300, 450, **600**	P G ..	X	0.40	4.00	
Beskytteren	OUM	—	Navy	**600**	O [5] ..	X	—	—	
Borglum [7]	OGFA	350	Dampskibsselskabet Dannebrog ..	300, 450, **600**, 800	P G ..	X	0.40	4.00	
Bothal [6]	OHG	150	Det Danske Kulkompagni ..	300, **600**	P G ..	X	0.40	4.00	
Botnia [1]	OXU	200	Det Forenede Dampskibsselskab	300, **600**	P G ..	X	0.40	4.00	
Bremersvold [7]	OHZ	200	Dampskibsselskabet Rodby Havn	300, 450, **600**	P G ..	X	0.40	4.00	

[1] Operated and controlled by the Soc. Anonyme International de Tel. sans fil, Brussels

[2] Operated and controlled by the owners

[3] Operated by the owner of vessel: controlled by the Soc. Anonyme Internat. de Tel. sans fils

[4] No ship charge

[5] Public correspondence, in plain language, may be admitted, without ship charge, if there is no naval correspondence

[6] During crossings

[7] Operated by the Dansk Radio Aktieselskab

Bryderon [8]	OYW	50	Det Forenede Dampskibsselskab	300, 600	P	..	X	—[4]	—[4]
C. F. Grove	OUO	100	Government	300, 600	P G	..	0730 to 1130 1530 to 1830 and 2030	—[4]	—[4]
Chassie Maersk [8] ..	OGH	200	Dampskibsselskabet af 1912, Copenhagen	300, 600	P	..	X	—[4]	—[4]
Chile OZV [8]	OZV	160	Det Ostasiatiske Co.	300, 600	P	..	X	—[4]	—[4]
Copenhagen OYA [8] ..	OYA	250	Det Oversöiske Compagnie ..	300, 450, 600	P	..	X	—[4]	—[4]
Danebod [8]	OGN	180	Rederiet Suenson & Jespersen ..	300, 450, 600	P G	..	X	0.40	4.00
Danebrog OGQ [8] ..	OGQ	180	Rederiet Quart, Copenhagen ..	300, 450, 600	P G	..	X	0.40	4.00
Danemark [7]	OHV	200	Rederiet Suenson & Jespersen ..	300, 450, 600	P G	..	X	0.40	4.00
Dania OGS [7]	OGS	160	Det Forenede Dampskibsselskab	300, 450, 600	P G	..	X	0.40	4.00
Dannebrog	OUD	—	Government	600	O[5]	..	X	—	—
Dansborg [7]	OHLA	350	Dannebrog Company	300, 450, 600 800	P G	..	X	0.40	4.00
Delagoa [7]	OGVA	200	Dampskibsselskabet Orient ..	300, 450, 600,	P G	..	X	0.40	4.00
Delfinen..	OVD	—	Navy	600	O[5]	..	X	—	—
Diana OWB	OWB	—	Navy	600	O[5]	..	X	—	—
Dronning Maud [8] ..	OYV	150	Det Forenede Dampskibsselskab, Copenhagen	300, 600	P G	..	X	0.40	4.00
Leonora Maersk [8] ..	OYY	200	Svendborg Co.	300, 600	P	..	X	—[4]	—[4]
Em. Z. Svitzer [8] ..	OGE	200	Em. Z. Svitzer Bjergnings-Entreprise	300, 600	P	..	X	0.40	4.00
Falkland [7]	OHF	200	Det Dansk-Franske Dampskibsselskab	300, 450, 600	P G	..	X	0.40	4.00
Falster	OWC	—	Navy	600	O	..	X	—	—
Falstria [8]	OZW	200	Det Ostasiatiske Co.	300, 600	P	..	X	—[4]	—[4]
Fenris	OWD	—	Navy	600	O[5]	..	X	—	—
Ficaria [1]..	OYH	150	Det Forenede Dampskibsselskab	300, 600	P G	..	X	0.40	4.00
Fionia [8]..	OZK	250	Det Ostasiatiske Co.	300, 600	P	..	X	—[4]	—[4]
Flora OHL [7]	OHL	200	Det Forenede Dampskibsselskab	300, 450, 600	P G	..	X	0.40	4.00
Flora OWE	OWE	—	Navy	600	O[5]	..	X	—	—
Fredensbro [7]	OIZ	150	Det Kobenhavnske Dampskibsselskab	300, 600	P G	..	X	0.40	4.00
Flyvefisken	OVF	—	Navy	600	O[5]	..	X	—	—
Fredericia	OYT	200	Nord-Ostersö Co.	300, 450, 600	P	..	0800 to 0900 1200 to 1300 1800 to 1900	—[4]	—[4]
Frederik VIII [1].. ..	OZL	200	Det Forenede Damps. A.S., Copen.	300, 600	P G	..	N	0.40	4.00
Frederiksborg [7] ..	OHJA	200	Dannebrog Company	300, 450, 600, 800	P G	..	X	0.40	4.00
Frieda OHW [7].. ..	OHW	200	Dampskibsselskabet Senta ..	300, 450, 600	P G	..	X	0.40	4.00
Galathea	OVG	—	Navy	600	O[5]	..	X	—	—
Gejser	OUG	—	Navy	600	O[5]	..	X	—	—
Georg Stage	OZY	100	S.A. Georg Stages Minde ..	300, 600	P	..	X	—[4]	—[4]
Grönsund	OWF	—	Navy	600	O[5]	..	X	—	—
Gudrun Maersk [8] ..	OGL	200	Dampskibsselskabet Svendborg..	300, 600	P	..	X	—[4]	—[4]
Guldborgsund	OWG	—	Navy	600	O[5]	..	X	—	—
Gullfoss [8]	OZU	200	Islands Dampskibsselskab (Eimskipafeleg Islands)	300, 600	P	..	X	0.40	4.00
Hajen	OWH	—	Navy	600	O[5]	..	X	—	—
Hammershus [7].. ..	OGDA	350	Dampskibsselskabet Dannebrog..	300, 450, 600, 800	P G	..	X	0.40	4.00
Hans Maersk [8].. ..	OYE	200	Rederiet A. P Moller, Copenhagen	300, 450, 600	P G	..	X	—[4]	—[4]
Havfruen	OVB	—	Navy	600	O[5]	..	X	—	—
Havhesten	OWI	—	Navy	600	O[5]	..	X	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
DENMARK—*contd.*									
Havkatten	OWT	—	Navy	600	O[6]	X	—	—	
Havmanden	OVE	—	Navy	600	O[6]	X	—	—	
Havörnen	OWJ	—	Navy	600	O[6]	X	—	—	
H. C. Orsted[8]	OZX	100	Det Store Nodiske Teleg.	300, **600**	P	X	—[4]	—[4]	
Hejmdal	OUJ	—	Navy	600	O[6]	X	—	—	
Helge[2]	OGD	200	Norden Co., Copenhagen	300, 450, **600**	P G	X	—[4]	—[4]	
Hellig Olav[1]	OZB	200	Det Forenede Dampskibsselskab	300, **600**	P G	N	0.40	4.00	
Herluf Trolle	OUH	—	Navy	600	O[6]	X	—	—	
Hjaleperen	OUQ	—	Navy	600	O[6]	X	—	—	
Hvarossen	OVH	—	Navy	600	O[6]	X	—	—	
Hvidehavet[8]	OGJ	250	Atlanterhavet Co., Copenhagen	300, **600**	P G	X	0.40	4.00	
I.C. La Cour[1]	OYL	150	Det Forenede Dampskibsselskab	300, **600**	P G	X	[6]0.40	4.00	
I. D. S. Adolph[7]	OHB	350	Dampskibsselskabet Vendila	300, 450, **600**	P G	X	0.40	4.00	
Indien[7]	OGBA	200	Dampskibsselskabet Orient	300, 450, **600**	P G	X	0.40	4.00	
Island[1]	OWK	—	Navy	600	O[6]	X	—	—	
Ingolf	OYZ	100	Det Forenede Dampskibsselskab	300, **600**	P G	X	0.40	4.00	
Islands Falk	OUI	—	Navy	600	O[6]	X	—	—	
Jan[7]	OGIA	200	Dampskibsselskabet Myren	300, 450, **600**	P G	X	0.40	4.00	
Jelling[7]	OIY	350	Dampskibsselskabet Dannebrog	300, 450, **600**, 800	P G	X	0.40	4.00	
Johan Siem[7]	OGR	150	Det Forenede Dampskibsselskab	300, **600**	P G	X	0.40	4.00	
Jomsborg	OHBA	250	Dannebrog Company	300, 450, **600**, 800	P G	X	0.40	4.00	
Josey[7]	OHN	200	Dampskibsselskabet Myren	300, 450, **600**	P G	X	0.40	4.00	
Jungshoved[7]	OGHA	350	Dampskibsselskabet Dannebrog	300, 450, **600**, 800	P G	X	0.40	4.00	
Jutlandia[8]	OZG	250	Det Ostasiatiske Co.	300, **600**	P	X	—[4]	—[4]	
Kattegat[8]	OGP	80	Em. Z. Svitzers Bjergningsentreprise	300, **600**	P G	X	0.40	4.00	
Kentucky OIB[7]	OIB	200	Det Forenede Dampskibsselskab	300, 450, **600**	P G	X	0.40	4.00	
Kina[7]	OGWA	200	Dampskibsselskabet Orion	300, 450, **600**	P G	X	0.40	4.00	
Knud II[7]	OHX	200	Det Forenede Dampskibsselskab	300, 450, **600**	P G	X	0.40	4.00	
Kong Haakon[7]	OGQA	200	Det Forenede Dampskibsselskab	300, 450, **600**	P G	X	0.40	4.00	
Kronborg[7]	OGGA	350	Dampskibsselskabet Dannebrog	303, 450, **600**, 800	P G	X	0.40	4.00	
Kronprins Frederik[7]	OHDA	200	Dampskibsselskabet Pacific	300, 450, **600**	P G	X	0.40	4.00	
Lifland[7]	OHI	200	Det Dansk-Franske Dampskibsselskab	300, 450, **600**	P G	X	0.40	4.00	
Lituania[7]	OIK	300	Det Ostasiatiske Kompagni	300, **600**	P G	N	0.40	4.00	
Lossen	OUL	—	Navy	600	O[6]	X	—	—	

Lövenorn	OUN	100	Government	300, 600	P G ..	0700 to 1100 1500 to 1900	—	—
L. P. Holmblad [7] ..	OGAA	200	Det Forenede Dampskibsselskab	300, 450, 600	P G ..	X	0.40	4.00
Makrelen	OWM	—	Navy	600	O [5] ..	X	—	—
Mexico OGF [3]	OGF	250	Det. Ostasiatiske Kompagni ..	300, 450, 600	P ..	X	—[4]	—[4]
Minekran V	OWO	—	Navy	600	O [5] ..	X	—	—
Minekran VI	OWP	—	Navy	600	O [5] ..	X	—	—
Moskow [1]	OGM	200	Det Forenede Dampskibsselskab	300, 450, 600	P G ..	X	0.40	4.00
Najaden	OVN	—	Navy	600	O [5] ..	X	—	—
Narhvalen	OWQ	—	Navy	600	O [5] ..	X	—	—
Natal OIE [7]	OIE	200	Dampskibsselskabet Orient ..	300, 450, 600	P G ..	X	0.40	4.00
Neptun	OVQ	—	Navy	600	O [5] ..	X	—	—
Newa [3]	OGZ	160	Det Forenede Dampskibsselskab	300, 450, 600	P G ..	X	0.40	4.00
Nidaros OGV [7] ..	OGV	160	Det Forenede Dampskibsselskab	300, 450, 600	P G ..	X	0.40	4.00
Nordamerika [3]	OXT	200	Dampskibssel Norden	300, 450, 600	P G ..	X	—[4]	—[4]
Nordhvalen [3]	OXZ	300	Dampskibssel Norden	300, 600	P G ..	X	—[4]	—[4]
Nordhavet [3]	OYM	160	Dampskibsselskabet Norden ..	300, 600	P G ..	X	—[4]	—[4]
Nordkap [3]	OYB	250	Dampskibsselskabet Norden ..	300, 600	P G ..	X	—[4]	—[4]
Nordkaperen	OWR	—	Navy	600	O [5] ..	X	—	—
Nordlys [3]	OZZ	200	Dampskibsselskabet Norden ..	300, 600	P G ..	X	—[4]	—[4]
Nymfen	OVC	—	Navy	600	O [5] ..	X	—	—
Olfert Fischer	OUF	—	Navy	600	O [5] ..	X	—	—
Oregon OIC [7]	OIC	350	Det Forenede Dampskibsselskab	300, 450, 600	P G ..	X	0.40	4.00
Orion OHEA [7]	OHEA	200	Dampskibsselskabet Orion ..	300, 450, 600	P G ..	X	0.40	4.00
Orkild [7]	OHAA	350	Dampskibsselskabet Dannebrog..	300, 450, 600, 800	P G ..	X	0.40	4.00
Ormen	OVO	—	Navy	600	O [5] ..	X	—	—
Orneborg [7]	OIM	200	Dampskibsselskabet Dannebrog..	300, 450, 600, 800	P G ..	X	0.40	4.00
Oscar II OZC [1]	OZC	200	Det Forenede Dampskibsselskab	300, 600	P G ..	N	0.40	4.00
Pacific OIG [3]	OIG	250	Det Oversöiske Compagnie ..	300, 450, 600	P ..	X	—[4]	—[4]
Pacific OZI [3]	OZI	250	Det Store Nordiske Telegraf. ..	300, 600	P ..	X	—[4]	—[4]
Panama OZQ [3]	OZQ	200	Det Ostasiatiske Co.	300, 600	P ..	X	—[4]	—[4]
Pennsylvania OIQ [7] ..	OIQ	200	Det Forenede Dampskibsselskab	300, 450, 600	P G ..	X	0.40	4.00
Peder Skram	OUP	—	Navy	600	O [5] ..	X	—	—
Peru OZA [3]	OZA	200	Det Ostasiatiske Co.	300, 600	P ..	X	—[4]	—[4]
Phönix OZO [3]	OZO	80	Dampskibsselskabet Norden ..	600	P G ..	X	—[4]	—[4]
Primula OYI [1]	OYI	150	Det Forenede Dampskibsselskab	300, 600	P G ..	X	0.40	4.00
Prins Christian [3] ..	OXG	135	Gjedser-Warnemunde Line (State Rly. Ferry)	300, 450, 600	O ..	—[9]	—[4]	—[4]
Princesse Alexandrine [3]	OXH	135	Gjedser-Warnemunde Line (State Rly. Ferry)	300, 450, 600	O ..	—[9]	—[4]	—[4]
Protector OYJ [3] ..	OYJ	Day 160 night 300	Em. Z. Svitzers, Bjerg., Copen. ..	300, 450, 600	P ..	X	0.40	—
Ran	OVL	—	Navy	600	O [5] ..	X	—	—
Rask [3]	OYX	200	Coal Depôt, Copenhagen	300, 600	P ..	X	—	—
Reval OYF [3]	OYF	100	Det Ostasiatiske Co.	300, 600	P G ..	X	—[4]	—[4]
Ribe [3]	OYS	200	Nord-Ostersö Rederiet, Copenhagen	300, 600	P ..	0800 to 0900 1200 to 1300 0800 to 1900	—[4]	—[4]
Rodfaxe [7]	OHFA	200	Dampskibsselskabet Primula ..	300, 450, 600	P G ..	X	0.40	4.00
Rota OWS	OWS	—	Navy	600	O [5] ..	X	—	—
Rota OYK [3]	OYK	150	Dampskibsselskabet Rota ..	300, 600	P ..	0800 to 0900 1200 to 1300 1800 to 1900	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
DENMARK—*contd.*									
Russ OHE [8]	OHE	100	Transport-og Bjergningsselskabet Union	300, 450, **600**	P G	X	—[4]	—[4]	
Russ OIR [7]	OIR	200	Det Forenede Dampskibsselskab	300, 450, **600**	P G	X	0.40	4.00	
Russ OYO [8]	OYO	200	Det Ostasiatiske Co.	300, **600**	P G	X	—[4]	—[4]	
Saelen	OWY	—	Navy	600	O [5]	X	—	—	
Saltholm	OWT	—	Navy	600	O [5]	X	—	—	
Selandia [8]	OZF	250	Det Ostasiatiske Co.	300, **600**	P	X	—[4]	—[4]	
Siam [8]	OZM	160	Det Ostasiatiske Co.	300, **600**	P	X	—[4]	—[4]	
Silkeborg [7]	OHT	200	Dampskibsselskabet Dannebrog	300, 450, **600**, 800	P G	X	0.40	4.00	
Sirius OHS [7]	OHS	200	Dampskibsselskabet Orion	300, 450, **600**	P G	X	0.40	4.00	
Skanderborg [7]	OIU	250	Dampskibsselskabet Dannebrog	300, 450, **600**, 800	P G	X	0.40	4.00	
Skjold	OUS	—	Navy	600	O [5]	X	—	—	
Smut [8]	OXS	200	Copenhagen Coal Depôt	300, 450, **600**	O	X	—[4]	—[4]	
Söbjörnen	OVJ	—	Navy	600	O [5]	X	—	—	
Söhunden	OWW	—	Navy	600	O [5]	X	—	—	
Sölöven	OWX	—	Navy	600	O [5]	X	—	—	
Sonderborg [7]	OIV	350	Dampskibsselskabet Dannebrog	300, 450, **600**, 800	P G	X	0.40	4.00	
Söridderen	OVR	—	Navy	600	O [5]	X	—	—	
Söulven	OVU	—	Navy	600	O [5]	X	—	—	
Spaekhuggeren	OVS	—	Navy	600	O [5]	X	—	—	
Springeren	OWU	—	Navy	600	O [5]	X	—	—	
Stillehavet [1]	OXV	300	Dampskibsselskabet Atlanterhavet	300, **600**	P G	X	0.40	4.00	
Store Nordiske [8]	OZJ	250	Det Store Nordiske Telegraf	300, **600**	P	X	—[4]	—[4]	
Stören	OWV	—	Navy	600	O [5]	X	—	—	
Strandholm [7]	OGT	180	Dampskibsselskabet Rodby Havn	300, 450, **600**	P G	X	0.40	4.00	
Svaerdfisken	OVW	—	Navy	600	O [5]	X	—	—	
Sydhavet [1]	OHD	250	Dampskibsselskabet Atlanterhavet	300, **600**	P G	X	0.40	4.00	
T. 7	OWL	—	Navy	600	O [5]	X	—	—	
T. 8	OWN	—	Navy	600	O [5]	X	—	—	
Thetis OVI	OVI	—	Navy	600	O [5]	X	—	—	
Thor OWY	OWY	—	Navy	600	O [5]	X	—	—	
Tjaldur [7]	OHK	200	Det Forenede Dampskibsselskab	300, 450, **600**	P G	X	0.40	4.00	
T. M. Werner [7]	OGW	250	Dampskibsselskabet Vendila	300, 450, **600**	P G	X	0.40	4.00	
Tongking [8]	OZP	160	Det Ostasiatiske Co.	300, **600**	P	X	—[4]	—[4]	
Tranquebar [8]	OGI	120	Orient Company, Copenhagen	300, **600**	P	X	—[4]	—[4]	
Transvaal [7]	OGXA	200	Dampskibsselskabet Orient	300, 450, **600**	P G	X	0.40	4.00	

Triton OVP	OVP	—	Navy	600	O[5] ..	X	—	—
Tumleren	OVT	—	Navy	600	O[5] ..	X	—	—
Uffe[7]	OGU	160	Det Forenede Dampskibsselskab	300, 450, 600	P G ..	X	0.40	4.00
United States OZD[1] ..	OZD	200	Det Forenede Dampskib	300, 600	P G ..	N	0.40	4.00
Valkyrien OUV ..	OUV	—	Navy	600	O[5] ..	X	—	—
Valkyrien[2]	OXY	100	Em. Z. Svitzers Bjerg-Enterprise	300, 600	P ..	X	0.40	4.00
Vega OHU[7]	OHU	200	Dampskibsselskabet Orion ..	300, 450, 600	P G ..	X	0.40	4.00
Venus OHY[7]	OHY	350	Dampskibsselskabet Orion ..	300, 450, 600	P G ..	X	0.40	4.00
Viborg[2]	OHA	300	Dannebrog Co., Copenhagen ..	300, 450, 600, 800	P G ..	X	0.40	4.00
Vidar OHJ[7]	OHJ	200	Det Forenede Dampskibsselskab	300, 450, 600	P G ..	X	0.40	4.00
Viking OZH[1] ..	OZH	160	Em. Z. Svitzers Bjerg-Enterprise	300, 600	P ..	X	—[4]	—[4]
Vindhunden	OVV	—	Navy	600	O[5] ..	X	—	—
Vinland[2]	OXP	200	Dansk-Amerikansk Dampskibs-selskab	300, 450, 600	P G ..	X	—[4]	—[4]
Virginia OIS[7]	OIS	200	Det Forenede Dampskibsselskab	300, 450, 600	P G ..	X	0.40	4.00
Wm. Th. Malling[7] ..	OHP	200	Det Danske Kulkompagni ..	300, 450, 600	P G ..	X	0.40	4.00
Yokohama	OGA	250	Det Oversöiske Co.	300, 450, 600	P ..	—	—[4]	—[4]
DUTCH EAST INDIES								
Barentsz[3]	PMI	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3, 4]	0.40	4.00
Baud[3]	ANL	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
Buyskes[3]	AOJ	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
California AOT[5] ..	AOT	200	N. v. Insulinde Tankstoomboot Myen	300, 600	P G ..	X	0.40	4.00
Camphuys[3]	ANY	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
De Greve[1]	PMF	200	Koninklijke Paketvaart Mij. ..	300, 600	P G ..	—[4]	0.40	4.00
De Haan[3]	ANS	150	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
De Klerk[3]	AOF	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
De Weert[3]	AOC	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
Duymaer van Twist[3] ..	AOB	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
Elout[3]	AOA	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
Gemma	APG	150	Government	300, 600	P G ..	X	—[3]	—[3]
Hercules PLG[1] ..	PLG	60	Navy	300, 600	O[4] ..	—	—	—
Houtman[3]	PMC	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3, 4]	0.40	4.00
India PLU[5]	PLU	200	N.V. Insulinde Tank S.S. Co. ..	300, 600	P G ..	—	0.40	4.00
Juno PKW[5]	PKW	150-200	Nederlandsch Indishe Tank S.S. Co.	—	—	—	—	—
Koetei	PLC	100	Navy	300, 600	O[2] ..	—	—	—
Le Maire[3]	PMQ	150	Koninklijke Paketvaart Mij. ..	300, 600	P G ..	—[3, 4]	0.40	4.00
Loudon[3]	AOG	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
Maetsuycher[3]	ANM	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
Mataram PLY	PLY	60	Navy	300, 600	O[2] ..	—	—	—
Melchior Troub[3] ..	PMD	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3, 4]	0.40	4.00
Mossel[3]	ANV	150	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
Myer[3]	AOE	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
Ombillin[3]	PMA	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3, 4]	0.40	4.00
Orion APO	APO	150	Government	300, 600	P G ..	X	—[3]	—[3]
Pijnacker Hordijk[3] ..	PKP	200	Koninklijke Paketvaart Mij. ..	300, 600	P G ..	—[3, 4]	0.40	4.00
Reael[3]	ANK	150	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
Reyniersz[3]	ANR	150	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
Rochussen[3]	AOI	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[3]	0.40	4.00
Roggeveen[3]	PMH	200	Kon. Paketvaart Mij.	300 600	P G ..	—[3, 4]	0.40	4.00

[1] Operated by the Société Anon. International de T.S.F. Brussels

[2] Public correspondence admitted without ship's charge when there is no official correspondence

[3] Operated by the Nederlandsche Radio-Telegraaf Co., Amsterdam-0400 to 0415, 0600 to 0800, 0900 to 1200, 1400 to 1500, 1700 to 1900, 2200 to 2300

[4] Mean time of Java

[5] Operated by the Nederlandsche Telegraaf Maatshappij Radio-Holland, Amsterdam

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
DUTCH EAST INDIES —contd.							Francs.	Francs.	
Rumphius [3]	PMK	200	Kon. Paketvaart Mij.	300, **600**	P G	—[3] [4]	0.40	4.00	
Schouten [3]	AOK	200	Kon. Paketvaart Mij.	300, **600**	P G	—[3]	0.40	4.00	
Serdang	APS	60	Navy	300, **600**	O [2]	—	—	—	
Siak [3]	ANN	150	Kon. Paketvaart Mij.	300, **600**	P G	—[3]	0.40	4.00	
Siam ANU [3]	ANU	150	Kon. Paketvaart Mij.	300, **600**	P G	—[3]	0.40	4.00	
Siberg [1]	PMB	200	Koninklijke Paketvaart Mij.	300, **600**	P G	—[4]	0.40	4.00	
Siboga [1]	PLZ	60	Navy	300, **600**	O	—	—	—	
's Jacob [3]	PMG	250	Kon. Paketvaart Mij.	300, **600**	P G	—[3]	0.40	4.00	
Sloet van de Belle [1]	PMS	200	Koninklijke Paketvaart Mij.	300, **600**	P G	—[4]	0.40	4.00	
Sumbawa	PLF	60	Navy	300, **600**	O [2]	—	—	—	
Swaerdecroom [3]	ANQ	150	Kon. Paketvaart Mij.	300, **600**	P G	—[3]	0.40	4.00	
Tarakan [3]	ANO	150	Kon. Paketvaart Mij.	300, **600**	P G	—[3]	0.40	4.00	
Telegraaf	PLA	380	Government (Cable Ship)	300, **600**, 1,000	O	—	—	—	
Tjibodas [3]	PLL	100-120	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjikembang [3]	PLH	200	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjikini [3]	PLM	100-200	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjilatjap [3]	PLP	150	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjiliwong [3]	PLN	150-200	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjimanoek [3]	PLJ	200	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjipanas [3]	PLO	150	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjisalak [3]	PLR	150-200	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjisoncari [3]	PLI	200	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjitaroem [3]	PLK	200	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tydeman	PLD	60	Navy	300, **600**	O [2]	—	—	—	
Van Cloon [3]	PMJ	200	Kon. Paketvaart Mij.	300, **600**	P G	—[3] [4]	0.40	4.00	
Van den Bosch [3]	ANX	200	Kon. Paketvaart Mij.	300, **600**	P G	—[3]	0.40	4.00	
Van der Hagen [3]	PMN	200	Kon. Paketvaart Mij.	300, **600**	P G	—[3] [4]	0.40	4.00	
Van Doorn	PLE	60	Navy	300, **600**	O [2]	—	—	—	
Van Heenskerk [1]	PKS	200	Koninklijke Paketvaart Mij.	300, **600**	P G	—[4]	0.40	4.00	
Van Hoorn [3]	ANP	150	Kon. Paketvaart Mij.	300, **600**	P G	—[3]	0.40	4.00	
Van Imhoff [1]	PMU	200	Koninklijke Paketvaart Mij.	300, **600**	P G	—[4]	0.40	4.00	
Van Lansberge [3]	ANZ	200	Kon. Paketvaart Mij.	300, **600**	P G	—[3]	0.40	4.00	
Van Linschoten [1]	PMT	200	Koninklijke Paketvaart Mij.	300, **600**	P G	—[4]	0.40	4.00	
Van Neck [3]	PKR	200	Koninklijke Paketvaart Mij.	300, **600**	P G	—[3] [4]	0.40	4.00	
Van Noort [3]	ANW	200	Kon. Paketvaart Mij.	300, **600**	P G	—[3]	0.40	4.00	
Van Outhoourn [3]	PKQ	200	Koninklijke Paketvaart Mij.	300, **600**	P G	—[3] [4]	0.40	4.00	
Van Overstraeten [3]	PME	200	Kon. Paketvaart Mij.	300, **600**	P G	—[3] [4]	0.40	4.00	
Van Rees [1]	PMV	200	Koninklijke Paketvaart Mij.	300, **600**	P G	—[4]	0.40	4.00	
Van Riebeeck [3]	AOH	200	Kon. Paketvaart Mij.	300, **600**	P G	—[3]	0.40	4.00	

Van Riemsdyk [8]	..	AOD	200	Kon. Paketvaart Mij.	300, 600	P G ..	—[8]	0.40	4.00
Van Spilbergen [8]	..	PMM	150	Kon. Paketvaart Mij.	300, 600	P G ..	—[8][4]	0.40	4.00
Van Swoll [8]	..	ANT	150	Kon. Paketvaart Mij.	300, 600	P G ..	—[8]	0.40	4.00
Van Waerwyck [8]	..	PKT	250	Kon. Paketvaart Mij.	300, 600	P G ..	—[8]	0.40	4.00
Zeeslang ..	..	PLB	60	Navy	300, 600	O [8] ..	—	—	—
EGYPT									
Abdel Moneim ..	..	SUG	162	Government	300, 600	O [1] ..	—	—	—
Alda ..	..	SUF	162	Government	300, 600	O [1] ..	—	—	—
Mahroussa ..	..	SUA	350	Government	300, 600	P ..	—	—	—
FINLAND									
Arcturus OJN [1]	..	OJN	250	—	300, 600	P G ..	—[2]	0.15	0.75
Ariadne OJM [1]	..	OJM	250	—	300, 600	P G ..	—[2]	0.15	0.75
Astrea [1] ..	..	OJO	250	—	300, 600	P G ..	—[2]	0.15	0.75
Sampo	..	OJK	250	Ice-breaker belonging to the State	400, 600	O ..	X	—	—
Sylfid [3]	..	OJQ	250	—	300, 600	P G ..	X	0.15	0.75
Tarmo	..	OJL	250	Ice-breaker belonging to the State	400, 600	O ..	X	—	—
Valtameri [4] ..	..	OJP	250	—	300, 600	P G ..	X	0.15	0.75
FIJI ISLANDS									
Pioneer VRL ..	..	VRL	—	Western Pacific High Commission	—	—	—	—	—
FRANCE									
Abda [1]	..	FPB	200	Cie de Navigation Paquet ..	300, 600	P G ..	N	0.40	—
Abd-el-Kader [1][9]	..	FGK	200	Cie Generale Transatlant ..	300, 600	P G ..	N	0.10	—
Actif	..	FACT	—	Navy	300, 600	P G ..	N	0.05	—
Aden [1]	..	FCN	—	Cie des Chargeurs Reunis ..	—	P G ..	N	0.40	—
Adrar [1]	..	FCZ	300	Cie des Chargeurs Reunis.. ..	300, 600	P G ..	X	0.40	—
Afrique FCR ..	..	FCR	Day 270 night 1,080	Cie des Chargeurs Reunis ..	300, 600	P G ..	—	0.40	—[8]
Afrique II ..	..	FHA	—	Poret-Lobez & Cie	—	P G ..	X	0.40	—
Agile	..	FBG	—	Navy	300, 600	P G ..	N	0.05	—
Aigle	..	FBWA	—	Navy	300, 600	P G ..	N	0.05	—
Ailette	..	FBPA	—	Navy	300, 600	P G ..	N	0.05	—
Aimee [1] ..	..	UKE	200	Jean Huret et Cie., Boulogne-sur-Mer	300, 600	P G	X	0.40	—
Aisne	..	FBAI	—	Navy	300, 600	P G ..	N	0.05	—
Albatros.. ..	..	FALB	—	Navy	300, 600	P G ..	N	0.05	—
Albertgallus [1] ..	..	UHH	200	Soc. Mar. et Comm. du Pacifique	300, 600	P G ..	X	0.40	—
Albi [1]	..	UMA	200	Soc. Maritime aux. de Transports	300, 600	P G ..	X	0.40	—
Aldébaran FALD	..	FALD	—	Navy	300, 600	P G ..	N	0.05	—
Alerte	..	FBLA	—	Navy	300, 600	P G ..	N	0.05	—
Alesia FSJ [1] ..	..	FSJ	450	Cie de Navigation Sud-Atlantique	300, 450, 600	P G ..	X	0.40	4.00
Alexandrine [1] ..	..	UKO	150	Gournay-Delpierre et Cie ..	300, 600	P G ..	X	0.40	—
Algérie	..	FYG	—	Cie de Bateaux de Vapeur du Nord	—	P G ..	X	0.40	—
Algérien ..	..	FBAG	—	Navy	300, 600	P G ..	N	0.05	—

Egypt: [1] This station is also open for urgent calls

Finland: [1] Operated by Finska Angfartygs Aktiebolaget, Helsingfors
[2] 0800 to 1000, 1200 to 1400, 1600 to 1800, 2000 to 2200
[3] Operated by Suomen Valtamerentakainen Kauppa O.Y., Helsingfors
[4] Operated by Undenkaupungin Laivaosa-keyhtio, Nystad

France: [1] Operated by Cie d'Exploitation Radio-Electrique, Paris
[2] Operated by the owner
[3] Cable ship
[4] Ship engaged in a regular service between Calais and Dover
[5] Ship engaged in a regular service between Dieppe and Newhaven
[6] Ship engaged in a regular service between France and Algeria
[7] Ship engaged in a regular service between France, Algeria and Tunis
[8] Ship engaged in a regular service between France and Corsica
[9] Ship engaged in a regular service between France, Corsica and Algeria

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.
FRANCE—*contd.*							Francs.	Francs.
Algol	FBGL	—	Navy	300, **600**	P G ..	N	0.05	—
Alsace FVK [2]	FVK	200	Sté Gén de Transports Mari. à Vapeur	300, **600**	P G ..	N	0.40	—
Alsace FWB [13]	FWB	300	Cie Francaise d'Armement et d'Importation de Nitrate de Soude	300, **600**	P G ..	X	0.40	—
Altaïr	FBLT	—	Navy	300, **600**	P G ..	—	0.05	—
Alumine [2]	FWI	—	Cie F. de Marine et de Commerce	—	P G ..	X	0.40	—
Alycon [1]	UHC	200	Bourgain Bourgain	300, **600**	P G ..	X	0.40	—
Amazone [1]	FMZ	300	Cie de Messageries Maritimes ..	300, **600**	P G ..	N	0.40	—
Ambroise Paré [1] ..	UKL	250	Fourmentin Avisse et Cie ..	300, **600**	P G ..	X	0.40	—
Amiens	FAMI	—	Navy	300, **600**	P G ..	N	0.05	—
Amiral-Aube	FAGB	—	Navy	300, **600**	P G ..	N	0.05	—
Amiral-Duperré [1] ..	FCE	250	Compagnie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—
Amiral Fourichon [1] ..	FCF	250	Compagnie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—
Amiral Ganteaume [1] ..	FCH	—	Compagnie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—
Amiral Jauréguiberry [1]	FCJ	250	Compagnie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—
Amiral Latouche-Tréville [1]	FCI	250	Compagnie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—
Amiral Nielly	FCX	250	Compagnie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—
Amiral Ponty	FCY	250	Compagnie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—
Amiral Rigault de Genouilly [1]	FCG	250	Compagnie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—
Amiral Sallandrouze de Lamornaix [1]	FCL	250	Compagnie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—
Amiral Troude [1] ..	FCT	250	Compagnie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—
Amiral Villaret-Joyeuse [1]	FCV	250	Compagnie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—
Amphitrite	FAPH	—	Navy	300, **600**	P G ..	N	0.05	—
Anatolie [1]	FPA	150	Cie de Navigation Paquet ..	300, **600**	P G ..	N	0.40	—
Ancre	FBNC	300	Navy	300, **600**	P G ..	N	0.05	—
Andrée	HTD	—	Soc. Les Affreteurs Reunis ..	—	—	—	—	—
André Lebon [1]	FNG	300	Compagnie des Messageries Maritimes	300, **600**	P G ..	N	0.40	—
André Pierré	FWV	200	Acher, Duhamel & Gournay ..	300, **600**	P G ..	X	0.40	—
Andromaque	FADR	—	Navy	300, **600**	P G ..	N	0.05	—
Angers	FZE	—	State Rlys. Adminstration ..	—	P G ..	X	0.15	3.50
Anglet [2]	FLK	—	Cie des Chargeurs Français Plisson et Cie	—	P G ..	X	0.40	—
Ango [1]	FCP	250	Cie des Chargeurs Reunis	300, **600**	P G ..	N	0.40	—

Remarks.

[10] Ship engaged in a regular service between France and Corsica, Algeria and Tunis

[11] Ship engaged in a regular service between France and Tunis

[12] Private yacht

[13] Operated by the Société Indépendante de T.S.F.

Angoluême [1]	FRG	200	Sté Maritime Auxil. de Transport	300, 600	P G ..	N	0.40	—
Annamite	FBAM	—	Navy	300, 600	P G ..	N	0.05	—
Annibal	FBAN	—	Navy	300, 600	P G ..	N	0.05	—
Antarès	FBMA	—	Navy	300, 600	P G ..	N	0.05	—
Antigone FANI ..	FANI	—	Navy	300, 600	P G ..	N	0.05	—
Antilles [1]	FQX	—	Cie Gen. Transatlantique ..	—	P G ..	N	0.40	—
Antilope	FATP	—	Navy	300, 600	P G ..	N	0.05	—
Antoinette [1]	FHO	—	V. Fourny	—	P G ..	X	0.40	—
Apache FBAP	FBAP	—	Navy	300, 600	P G ..	N	0.05	—
Apache FYP [13] ..	FYP	150	H. Legru	300	P G ..	N	—	—
Apollon	FRL	—	Soc. Les Affreteurs Reunis ..	—	P ..	X	0.40	—
Aquitaine [2]	FVO	200	Soc. Générale des Transports Maritimes à Vapeur	300, 600	P G ..	X	0.40	—
Arabe	FBRA	—	Navy	300, 600	P G ..	N	0.05	—
Arbalète	FBAE	—	Navy	300, 600	P G ..	N	0.05	—
Ardèche [1]	FQA	160	Cie Gén. Transatlantique ..	300, 600	P G ..	N	0.40	—
Ardent	FBAR	—	Navy	300, 600	P G ..	N	0.05	—
Aréthuse	FATH	—	Navy	300, 600	P G ..	N	0.05	—
Ariadne	FYI	150	—	300, 600	P G ..	X	0.40	—
Arlette [13]	FZB	300	Cie Auxilaire de Navigation ..	300, 600	P G ..	X	0.40	—
Armand-Béhic [1] ..	FMB	300	Compagnie des Messageries Maritimes	300, 600	P G ..	N	0.40	—
Arménie [1]	FPR	200	Cie de Navigation Paquet ..	300, 600	P G ..	N	0.40	—
Arras	FBXA	—	Navy	300, 600	P G ..	N	0.05	—
Arriluse	UBS	—	Soc. de Welladorid-Bilbao ..	—	—	—	—	—
Asie FCA [1]	FCA	250	Cie des Chargeurs Reunis ..	300, 600	P G ..	N	0.40	—
Asie FHI [1]	FHI	250	Poret, Lobes & Cie.	300, 600	P G ..	X	0.40	—
Aspirant-Herber ..	FBHR	—	Navy	300, 600	P G ..	N	0.05	—
Aster FPT [1]	FPT	—	Cie de Navigation Paquet ..	—	P G ..	N	0.40	—
Astrée FASR ..	FASR	—	Navy	300, 600	P G ..	N	0.05	—
Astrée FWS	FWS	80	Soc. Nav. Caennaise	300, 600	P G ..	N	0.40	—
Astrolabe	FABT	—	Navy	300, 600	P G ..	N	0.05	—
Atalante	FANT	—	Navy	300, 600	P G ..	N	0.05	—
Athlète FATL ..	FATL	—	Navy	300, 600	P G ..	N	0.05	—
Athlète FQU [1]	FQU	—	Cie Gén. Transatlantique ..	—	P G ..	N	0.40	—
Atlantique FMT [1] ..	FMT	300	Cie des Messageries Maritimes ..	300, 600	P G ..	N	0.40	—
Atlantique FYK [1] ..	FYK	300	A. Coppin et Cie, Boulogne sur-Mer	300, 600	P G ..	X	0.40	—
Atmah [13]	FYA	200	Baron E. de Rothschild	300, 600	P G ..	N	—	—
Aube [1]	FGV	—	Cie Gén. Transatlantique ..	—	P G ..	N	0.40	—
Audacieuse	FBKD	—	Navy	300, 600	P G ..	N	0.05	—
Aurigny [1]	FSA	200	Cie des Chargeurs Reunis.. ..	300, 600	P G ..	N	0.40	—
Aurochs..	FARH	—	Navy	300, 600	P G ..	N	0.05	—
Automne [1]	FHU	200	Delpierre et Fils	300, 600	P G ..	X	0.40	—
Avant-Garde [13] ..	UKU	300	Soc. La Pêche Française ..	300, 600	P G ..	X	0.40	—
Aventurier	FBAV	—	Navy	300, 600	P G ..	N	0.05	—
Baccarat FBAC ..	FBAC	—	Navy	300, 600	P G ..	N	0.05	—
Bacchante [13]	FYB	150	Henri Menier	300, 600	P G ..	N	0.40	—
Bagdad FMY [1].. ..	FMY	300	Cie des Messageries Maritimes ..	300, 600	P G ..	N	0.40	—
Baleines (Les) [1] ..	FBL	200	Cie des Pêcheries Mar. de l'Atlantique	300, 600	P G ..	X	0.40	—
Balny	FABN	—	Navy	300, 600	P G ..	N	0.05	—
Bambara	FBMR	—	Navy	300, 600	P G ..	N	0.05	—
Baoulé [1]	FSO	—	Cie des Chargeurs Reunis.. ..	—	P G ..	N	0.40	—
Bapaume	FBPM	—	Navy	300, 600	P G ..	N	0.05	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
FRANCE—*contd.*							Francs.	Francs.	
Bar-le-Duc	FBLD	—	Navy	300, **600**	P G	N	0.05	—	
Basque [1]	FMU	250	Cie des Messageries Maritimes	300, **600**	P G	N	0.40	—	
Bassee-Terre [1]	FQE	250	Cie Gen. Transatlantique	300, **600**	P G	N	0.40	—	
Batailleuse	FBAT	—	Navy	300, **600**	P G	N	0.05	—	
Belfort FABL	FABL	—	Navy	300, **600**	P G	N	0.05	—	
Bélier	FBLE	—	Navy	300, **600**	P G	N	0.05	—	
Bellatrix FBET	FBET	—	Navy	300, **600**	P G	N	0.05	—	
Belle-Isle [1]	FSI	200	Cie des Chargeurs Reunis	300, **600**	P G	N	0.40	—	
Belliqueuse	FBIQ	—	Navy	300, **600**	P G	N	0.05	—	
Bellone	FABO	—	Navy	300, **600**	P G	N	0.05	—	
Bernache [1]	FOQ	150	Soc. Les Chalutiers de la Rochelle	300, **600**	P G	X	0.40	—	
Béthune	FABE	—	Navy	300, **600**	P G	N	0.05	—	
Bien-Hoa	FABH	—	Navy	300, **600**	P G	N	0.05	—	
Biskra [1 7]	FGA	250	Cie Gén. Transatlantique	300, **600**	P G	N	0.10	—	
Bisson FBIS	FBIS	—	Navy	300, **600**	P G	N	0.05	—	
Bisson FBX [1]	FBX	200	Cie Lorientaise de Chalutage	300, **600**	P G	X	0.40	—	
Blois [1]	FRO	200	Soc. Mar. aux de Transports	300, **600**	P G	X	0.40	—	
Boeuf	FAQB	—	Navy	300, **600**	P G	N	0.05	—	
Bois des Buttes [1]	FBY	200	Soc. Anon. de Pêche et d'Armément de l'Ouest	300, **600**	P G	X	0.40	—	
Bois des Caures [1]	FOO	200	Soc. Anon. de Pêche et d'Armément de l'Ouest	300, **600**	P G	X	0.40	—	
Bordeaux FKD [1]	FKD	—	Soc. Mar. aux de Transports	—	P G	X	0.40	—	
Bordeaux FZG [5]	FZG	70	State Railway Administration	300, **600**	P G	X	0.15	3.50	
Borée	FAOB	—	Navy	300, **600**	P G	N	0.05	—	
Bosphore [1]	FIB	300	Cie des Messageries Maritimes	300, **600**	P G	N	0.40	—	
Bouclier	FBOU	—	Navy	300, **600**	P G	N	0.05	—	
Bouffonne	FBON	—	Navy	300, **600**	P G	N	0.05	—	
Bougainville [1]	FCB	200	—	300, **600**	P G	N	0.40	—	
Bourdonnais UDU (La)	UDU	400	Cie Générale Transatlantique	300, 450, **600**, 800	P G	X	0.40	—	
Bourges [1]	FRK	200	Soc. Mar. aux. de Transports	300, **600**	P G	N	0.40	—	
Bout-Dehors	FABR	—	Navy	300, **600**	P G	N	0.05	—	
Braga [1]	FJE	300	Cie Française de Nav. à Vapeur Cyprien Fabre et Cie	300, 450, **600**	P G	N	0.40	—	
Brave	FAWB	—	Navy	300, **600**	P G	N	0.05	—	
Brest [5]	FZC	—	State Railway Administration	—	P G	X	0.15	3.50	
Bretagne FAHB	FAHB	—	Navy	300, **600**	P G	N	0.05	—	
Breton [1]	FIN	—	Cie des Messageries Maritimes	—	P G	N	0.40	—	

Britannia FJG[1] ..	FJG	200	Cie f. de Nav. à Vap. Cyprien Fabre & Cie	300, 600	P G ..	N	0.40	—
Brumaire	FARV	—	Navy	300, 600	P G ..	N	0.05	—
Buffle	FBUL	—	Navy	300, 600	P G ..	N	0.05	—
C. 1 FAPQ	FAPQ	—	Navy	300, 600	P G ..	N	0.05	—
C. 2	FASJ	—	Navy	300, 600	P G ..	N	0.05	—
C. 4 FBPY	FBPY	—	Navy	300, 600	P G ..	N	0.05	—
C. 5 FBRW	FBRW	—	Navy	300, 600	P G ..	N	0.05	—
C. 7	FAPW	—	Navy	300, 600	P G ..	N	0.05	—
C. 8	FBVZ	—	Navy	300, 600	P G ..	N	0.05	—
C. 9	FBOV	—	Navy	300, 600	P G ..	N	0.05	—
C. 10	FBYZ	—	Navy	300, 600	P G ..	N	0.05	—
C. 11	FADW	—	Navy	300, 600	P G ..	N	0.05	—
C. 12	FBWX	—	Navy	300, 600	P G ..	N	0.05	—
C. 13	FBPK	—	Navy	300, 600	P G ..	N	0.05	—
C. 14	FBTQ	—	Navy	300, 600	P G ..	N	0.05	—
C. 15	FBOW	—	Navy	300, 600	P G ..	N	0.05	—
C. 16	FBMV	—	Navy	300, 600	P G ..	N	0.05	—
C. 17	FARL	—	Navy	300, 600	P G ..	N	0.05	—
C. 18	FBRJ	—	Navy	300, 600	P G ..	N	0.05	—
C. 19	FBOQ	—	Navy	300, 600	P G ..	N	0.05	—
C. 20	FBUH	—	Navy	300, 600	P G ..	N	0.05	—
C. 21	FBVX	—	Navy	300, 600	P G ..	N	0.05	—
C. 22	FAOS	—	Navy	300, 600	P G ..	N	0.05	—
C. 23	FAVB	—	Navy	300, 600	P G ..	N	0.05	—
C. 24	FABI	—	Navy	300, 600	P G ..	N	0.05	—
C. 25	FAZS	—	Navy	300, 600	P G ..	N	0.05	—
C. 26	FAQU	—	Navy	300, 600	P G ..	N	0.05	—
C. 27	FABZ	—	Navy	300, 600	P G ..	N	0.05	—
C. 28	FAYU	—	Navy	300, 600	P G ..	N	0.05	—
C. 29	FBEW	—	Navy	300, 600	P G ..	N	0.05	—
C. 30	FAGW	—	Navy	300, 600	P G ..	N	0.05	—
C. 31	FACJ	—	Navy	300, 600	P G ..	N	0.05	—
C. 32	FBHD	—	Navy	300, 600	P G ..	N	0.05	—
C. 33	FADS	—	Navy	300, 600	P G ..	N	0.05	—
C. 34	FAGH	—	Navy	300, 600	P G ..	N	0.05	—
C. 35	FAWO	—	Navy	300, 600	P G ..	N	0.05	—
C. 36	FBMX	—	Navy	300, 600	P G ..	N	0.05	—
C. 37	FBDJ	—	Navy	300, 600	P G ..	N	0.05	—
C. 38	FBNW	—	Navy	300, 600	P G ..	N	0.05	—
C. 39	FAMY	—	Navy	300, 600	P G ..	N	0.05	—
C. 41	FARJ	—	Navy	300, 600	P G ..	N	0.05	—
C. 42	FAHI	—	Navy	300, 600	P G ..	N	0.05	—
C. 44	FAUN	—	Navy	300, 600	P G ..	N	0.05	—
C. 45	FASY	—	Navy	300, 600	P G ..	N	0.05	—
C. 46	FBAK	—	Navy	300, 600	P G ..	N	0.05	—
C. 47	FBDZ	—	Navy	300, 600	P G ..	N	0.05	—
C. 49	FAJK	—	Navy	300, 600	P G ..	N	0.05	—
C. 50	FAIP	—	Navy	300, 600	P G ..	N	0.05	—
C. 51	FACU	—	Navy	300, 600	P G ..	N	0.05	—
C. 52	FAKD	—	Navy	300, 600	P G ..	N	0.05	—
C. 53	FALK	—	Navy	300, 600	P G ..	N	0.05	—
C. 54	FAOU	—	Navy	300, 600	P G ..	N	0.05	—
C. 55	FAQO	—	Navy	300, 600	P G ..	N	0.05	—
C. 56	FAHZ	—	Navy	300, 600	P G ..	N	0.05	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
FRANCE—*contd.*									
C. 57	FATI	—	Navy	300, **600**	P G	N	0.05	—	
C. 58	FAJW	—	Navy	300, **600**	P G	N	0.05	—	
C. 59	FBVU	—	Navy	300, **600**	P G	N	0.05	—	
C. 60	FAYW	—	Navy	300, **600**	P G	N	0.05	—	
C. 61	FAUX	—	Navy	300, **600**	P G	N	0.05	—	
C. 62	FAZH	—	Navy	300, **600**	P G	N	0.05	—	
C. 63	FAMX	—	Navy	300, **600**	P G	N	0.05	—	
C. 64	FAVS	—	Navy	300, **600**	P G	N	0.05	—	
C. 65	FAXL	—	Navy	300, **600**	P G	N	0.05	—	
C. 66	FBNH	—	Navy	300, **600**	P G	N	0.05	—	
C. 67	FBUV	—	Navy	300, **600**	P G	N	0.05	—	
C. 68	FBOD	—	Navy	300, **600**	P G	N	0.05	—	
C. 69	FBZQ	—	Navy	300, **600**	P G	N	0.05	—	
C. 70	FBJU	—	Navy	300, **600**	P G	N	0.05	—	
C. 72	FAKX	—	Navy	300, **600**	P G	N	0.05	—	
C. 73	FBUD	—	Navy	300, **600**	P G	N	0.05	—	
C. 74	FBVJ	—	Navy	300, **600**	P G	N	0.05	—	
C. 75	FBQW	—	Navy	300, **600**	P G	N	0.05	—	
C. 76	FBMZ	—	Navy	300, **600**	P G	N	0.05	—	
C. 77	FAYG	—	Navy	300, **600**	P G	N	0.05	—	
C. 78	FBAL	—	Navy	300, **600**	P G	N	0.05	—	
C. 79	FAKN	—	Navy	300, **600**	P G	N	0.05	—	
C. 80	FANW	—	Navy	300, **600**	P G	N	0.05	—	
C. 81	FAOZ	—	Navy	300, **600**	P G	N	0.05	—	
C. 82	FAQZ	—	Navy	300, **600**	P G	N	0.05	—	
C. 83	FBJZ	—	Navy	300, **600**	P G	N	0.05	—	
C. 85	FADK	—	Navy	300, **300**	P G	N	0.05	—	
C. 86	FBUX	—	Navy	300, **600**	P G	N	0.05	—	
C. 87	FBLX	—	Navy	300, **600**	P G	N	0.05	—	
C. 88	FBGW	—	Navy	300, **600**	P G	N	0.05	—	
C. 89	FBID	—	Navy	300, **600**	P G	N	0.05	—	
C. 90	FBKZ	—	Navy	300, **600**	P G	N	0.05	—	
C. 91	FBDQ	—	Navy	300, **600**	P G	N	0.05	—	
C. 92	FBQL	—	Navy	300, **600**	P G	N	0.05	—	
C. 93	FBTV	—	Navy	300, **600**	P G	N	0.05	—	
C. 94	FBOZ	—	Navy	300, **600**	P G	N	0.05	—	
C. 95	FBMD	—	Navy	300. **600**	P G	N	0.05	—	
C. 96	FAIY	—	Navy	300, **600**	P G	N	0.05	—	

C. 97	FBZW	—	Navy	300, 600	P G ..	N	0.05	—	
C. 98	FBQK	—	Navy	300, 600	P G ..	N	0.05	—	
C. 99	FBVP	—	Navy	300, 600	P G ..	N	0.05	—	
Cactus	FBJC	—	Navy	300, 600	P G ..	N	0.05	—	
Calais	FBCA	—	Navy	300, 600	P G ..	N	0.05	—	
Californie [1]	FTK	250	Cie Gén. Transatlantique ..	300, 600	P G ..	N	0.40	—	
Cambrai [5]	FYC	—	State Railway Administration ..	—	P G ..	X	0.15	3.50	
Camélia	FBTC	—	Navy	300, 600	P G ..	N	0.05	—	
Campinas FCS [1]	FCS	200	Cie des Chargeurs Reunis ..	300, 600	P G ..	N	0.40	—	
Canada FJC [1]	FJC	250	Cie f. de Nav. à Vap. Cyprien Fabre & Cie	300, 600	P G ..	N	0.40	—	
Canard	FAUC	—	Navy	300, 600	P G ..	N	0.05	—	
Cantal [1]	FGC	200	Cie Gén. Transatlantique ..	300, 600	P G ..	N	0.40	—	
Cap Fagnet [1]	FBB	200	Soc. les Pêcheries de Fécamp ..	300, 600	P G ..	X	0.40	—	
Capitaine Coulon [1] ..	FQK	200	Compagnie Générale Transatlant.	300, 600	P G ..	X	0.40	—	
Capitaine Faure [1] ..	FMF	600	Cie des Messageries Maritimes ..	300, 600	P G ..	N	0.40	—	
Capitaine-Mehl	FBYC	—	Navy	300, 600	P G ..	N	0.05	—	
Cap Lopez [1]	UHV	200	Soc. Anon. de Gérance et d'Armement	300, 630	P G ..	X	0.40	—	
Capricieuse	FBCZ	—	Navy	300, 600	P G ..	N	0.05	—	
Caraïbe [1]	FQC	—	Cie Gén Transatlantique	—	P G ..	N	0.40	—	
Caravellas [1]	FCK	200	Cie des Chargeurs Reunis ..	300, 600	P G ..	N	0.40	—	
Caravelle [1]	FTC	250	Cie Gén. Transatlantique ..	300, 600	P G ..	N	0.40	—	
Carbet [1]	FTY	350	Cie Gen. Transatlantique, Paris..	300, 600	P G ..	X	0.40	—	
Carmen FAC [1]	FAC	—	Cie France-Atlantique	—	P G ..	X	0.40	—	
Carnoules [1]	FKE	200	Soc. Maritime Nationale.. ..	300, 600	P G ..	X	0.40	—	
Carol I [1]	FYH	—	L. Dreyfus & Cie...	—	P G ..	X	0.40	—	
Caroline FTO [1]	FTO	250	Cie Gén. Transatlantique ..	300, 800	P G ..	N	0.40	—	
Caroubier	FBCR	—	Navy	300, 600	P G ..	N	0.05	—	
Carquois	FBHC	—	Navy	300, 600	P G ..	N	0.05	—	
Casque	FBCQ	—	Navy	300, 800	P G ..	N	0.05	—	
Cassard	FASD	—	Navy	300, 600	P G ..	N	0.05	—	
Cassiopée	FBIO	—	Navy	300, 600	P G ..	N	0.05	—	
Catinat [1]	UCT	300	Cie Havraise Peninsulaire de Nav. à Vapeur	300, 450, 600	P G ..	X	0.40	—	
Caucase [1]	FIC	250	Cie des Messageries Maritimes ..	300, 800	P G ..	N	0.40	—	
Cavalier	FBCV	—	Navy	300, 600	P G ..	N	0.05	—	
Cavallaire [1]	FKF	200	Soc. Maritime Nationale.. ..	300, 600	P G ..	X	0.40	—	
Cecile [1]	UKI	200	Société Dieppoise d'Armement à la Pêche	300, 600	P G ..	X	0.40	—	
Cèdre	FAHC	—	Navy	300, 600	P G ..	N	0.05	—	
Centaure	FACE	—	Navy	300, 600	P G ..	N	0.05	—	
Cerbère	FARB	—	Navy	300, 600	P G ..	N	0.05	—	
Ceylan [1]	FCC	300	Cie des Chargeurs Réunis.. ..	300, 600	P G ..	N	0.40	—	
Chamois	FACH	—	Navy	300, 600	P G ..	N	0.05	—	
Champagne (La) [1] ..	UHF	200	Victor Le Claire, Boulogne-sur-Mer	300, 600	P G ..	X	0.40	—	
Champlain FBCH ..	FBCH	—	Navy	300, 600	P G ..	N	0.05	—	
Charles Roux [1] [6] ..	FGR	200	Cie Gén. Transatlantique.. ..	300, 600	P G ..	N	0.10	—	
Charlotte [1]	FHC	150	A. et G. Vidor Fils	300, 600	P G ..	X	0.40	—	
Charrue	FAMC	—	Navy	300, 600	P G ..	N	0.05	—	
Chassiron [1]	FBN	200	Cie des Pêcheries Maritimes de l'Atlantique	300, 600	P G ..	X	0.40	—	
Château-Latour ..	FWT	—	Worms et Cie, Paris	—	P G ..	X	0.40	—	
Château-Palmer ..	FWR	200	Worms et Cie, Paris	300, 600	P G ..	X	0.40	—	
Chateaurenault ..	FACR	—	Navy	300, 600	P G ..	N	0.05	—	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
FRANCE—*contd.*							Francs.	Francs.	
Chêne	FAQC	—	Navy	300, **600**	P G	N	0.05	—	
Chezine [1]	FAD	200	Cie Nantaise de Navigation à Vapeur	300, **600**	P G	X	0.40	—	
Chicago FTI [1]	FTI	300	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
Chili [1]	FMC	300	Cie des Messageries Maritimes	300, **600**	P G	N	0.40	—	
Cimeterre	FBCM	—	Navy	300, **600**	P G	N	0.05	—	
Circassie [1]	FPC	200	N. Paquet et Cie	300, **600**	P G	N	0.40	—	
Cite de Verdun [1]	UKS	180	Soc. les Pêcheries de la Mer du Nord	300, **600**	P G	X	0.40	—	
Clameur	FACM	—	Navy	300, **600**	P G	N	0.05	—	
Claymore	FBWC	—	Navy	300, **600**	P G	N	0.05	—	
Clématite	FACI	—	Navy	300, **600**	P G	N	0.05	—	
Clorinde	FACL	—	Navy	300, **600**	P G	N	0.05	—	
Coëtlogon	FBCT	—	Navy	300, **600**	P G	N	0.05	—	
Cognée	FBUC	—	Navy	300, **600**	P G	N	0.05	—	
Colmar [1]	FDR	—	Cie les Armateurs Français, Paris	—	P G	X	0.40	—	
Colombe	FBCO	—	Navy	300, **600**	P G	N	0.05	—	
Colonel Driant [1]	FDE	—	Puech Fils	—	P G	X	0.40	—	
Commandant Bory	FBRY	—	Navy	300, **600**	P G	N	0.05	—	
Commandant Dorise [1]	FIS	—	Cie des Messageries Maritimes	—	P G	N	0.40	—	
Commandant Lucas	FBEL	—	Navy	300, **600**	P G	N	0.05	—	
Commandant Riviere	FBRI	—	Navy	300, **600**	P G	N	0.05	—	
Commissaire Pierre Lecocq [1]	FMQ	300	Cie des Messageries Maritimes	300, **600**	P G	X	0.40	—	
Condé FACX	FACX	—	Navy	300, **600**	P G	N	0.05	—	
Condé FLD [1]	FLD	200	Cie Havraise Péninsulaire de Nav. à Vapeur	300, **600**	P G	N	0.40	—	
Condorcet	FANC	—	Navy	300, **600**	P G	N	0.05	—	
Conquérante	FBEC	—	Navy	300, **600**	P G	N	0.05	—	
Coq FACQ	FACQ	—	Navy	300, **600**	P G	N	0.05	—	
Coquelicot	FATC	—	Navy	300, **600**	P G	N	0.05	—	
Cordillière [1]	FMR	300	Cie des Messageries Maritimes	300, **600**	P G	N	0.40	—	
Corneille [1]	FWC	—	Delmas Frères	—	P G	X	0.40	—	
Corsica [1 3]	FRC	200	Fraissinet & Cie	300, **600**	P G	N	0.10	—	
Corte II [1 3]	FRT	200	Fraissinet & Cie	300, **600**	P G	N	0.10	—	
Coubre (La) [1]	FDB	100	Cie des Pêcheries Maritimes de l'Atlantique	300, **600**	P G	X	0.40	—	
Coucy FBCY	FBCY	—	Navy	300, **600**	P G	N	0.05	—	
Coucy UKJ [1]	UKJ	180	Soc. Dieppoise d'Armement à la Pêche	300, **600**	P G	X	0.40	—	
Courageuse	FBCG	—	Navy	300, **600**	P G	N	0.05	—	

Courbet	FACO		Navy	300, **600**	P G ..	N	0.05	—
Coutelas	FBZC	—	Navy	300, **600**	P G ..	N	0.05	—
Crabo	FABJ	—	Navy	300, **600**	P G ..	N	0.05	—
Craonne FAON ..	FAON	—	Navy	300, **600**	P G ..	N	0.05	—
Craonne II [1]	FDZ	—	Puech **Fils**	—	P G ..	X	0.40	—
Crimée [1]	FMK	250	Cie des **Messageries Maritimes** ..	300, **600**	P G ..	N	0.40	—
Curie	FAUR	—	Navy	300, **600**	P G ..	N	0.05	—
Curieuse	FBLC	—	Navy	300, **600**	P G ..	N	0.05	—
Cyclope	FACY	—	Navy	300 **600**	P G ..	N	0.05	—
Dahomey	FSH	—	Cie des **Chargeurs Réunis** ..	—	P G ..	N	0.40	—
Damier [1]	FBZ	180	**Soc. les Chalutiers de La Rochelle**	300, **600**	P G ..	X	0.40	—
Danube FID [1]	FID	250	Cie des **Messageries Maritimes**	300, **600**	P G ..	N	0.40	—
Daphné FAPN	FAPN	—	Navy	300, **600**	P G ..	N	0.05	—
Décidée	FBGD	—	Navy	300, **600**	P G ..	N	0.05	—
Dédaigneuse	FBDN	—	Navy	300, **600**	P G ..	N	0.05	—
Dehorter	FBDH	—	Navy	300, **600**	P G ..	N	0.05	—
Démocratie	FATE	—	Navy	300, **600**	P G ..	N	0.05	—
D'Entrecasteaux [1] ..	FSE	—	Cie des **Chargeurs Réunis** ..	—	P G ..	N	0.40	—
Desaix	FAXD	—	Navy	300, **600**	P G ..	N	0.05	—
D'Estrées	FAJE	—	Navy	300, **600**	P G ..	N	0.05	—
Diana FAIN	FAIN	—	Navy	300, **600**	P G ..	N	0.05	—
Diderot	FACD	—	Navy	300, **600**	P G ..	N	0.05	—
Diligente	FBDL	—	Navy	300, **600**	P G ..	N	0.05	—
Divatte [1]	FAU	250	Cie Nantaise de Nav. à Vapeur ..	300 **600**	P G ..	N	0.40	—
Divona [1]	FSD	300	Cie de Nav. Sud-Atlantique ..	300, **600**	P G ..	N	0.40	—
Docteur Pierre Benoit [1]	FIK	—	Cie des Messageries Maritimes ..	—	P G ..	N	0.40	—
Dolphin FAOD ..	FAOD	—	Navy	300, **600**	P G ..	N	0.05	—
Dorade	FADO	—	Navy	300, **600**	P G ..	N	0.05	—
Dordogne	FAND	—	Navy	300, **600**	P G ..	N	0.05	—
Doris UDR [13]	UDR	300	Soc. les **Affréteurs Reunis** ..	300, **600**	P G ..	N	0.40	—
Doudart-de-Lagrée ..	FADL	—	Navy	300, **600**	P G ..	N	0.05	—
Doukkala [1]	FPD	200	N. Paquet et Cie	300, **600**	P G ..	N	0.40	—
Draa [1]	FPZ	200	N. Paquet et Cie	300, **600**	P G ..	N	0.40	—
Drôme [1]	FQD	—	Cie Gén. Transatlantique ..	—	P G ..	N	0.40	—
Dubourdieu	FBDU	—	Navy	300, **600**	P G ..	N	0.05	—
Duc d'Aumale [1] [6] ..	FGD	250	Cie Gén. **Transatlantique** ..	300, **600**	P G ..	N	0.10	—
Du Chaffault	FBDC	—	Navy	300, **600**	P G ..	N	0.05	—
Du Chayla	FADC	—	Navy	300, **600**	P G ..	N	0.05	—
Ducouëdic FBDK ..	FBDK	—	Navy	300, **600**	P G ..	N	0.05	—
Ducouëdic FBT [1] ..	FBT	200	Cie Lorientaise de Chalutage ..	300, **600**	P G ..	X	0.40	—
Dugay-Trouin	FBDG	—	Navy	300, **600**	P G ..	N	0.05	—
Dumbéa [1]	FND	300	Cie des **Messageries Maritimes** ..	300, **600**	P G ..	N	0.40	—
Dumont d'Urville ..	FBDV	—	Navy	300, **600**	P G ..	N	0.05	—
Dunkerque	FAHD	—	Navy	300, **600**	P G ..	N	0.05	—
Duperre	FADP	—	Navy	300, **600**	P G ..	N	0.05	—
Du-Petit-Thouars ..	FAPT	—	Navy	300, **600**	P G ..	N	0.05	—
Dupleix FCD [1] ..	FCD	250	Cie des Chargeurs Réunis ..	300, **600**	P G ..	N	0.40	—
Dupleix FIX [1] ..	FIX	300	Cie des **Messageries Maritimes** ..	300, **600**	P G ..	N	0.40	—
Dupuy-de-Lôme ..	FAUY	—	Navy	300, **600**	P G ..	N	0.05	—
Edgar-Quinet	FADQ	—	Navy	300, **600**	P G ..	N	0.05	—
Edith Cavell FHL [1] ..	FHL	100	Mory et Cie	300, **600**	P G ..	N	0.40	—
Edouard Jéramec [8] ..	FZJ	250	Cie F. des Câbles Télégraphiques	300, **600**	P ..	X	0.40	—
Edouard Shaki [1] ..	FRS	150	Soc. les Affréteurs	300 **600**	P G ..	N	0.40	—
Eglantine FBF ..	FBF	150	Soc. **la Pêche Française** ..	300, **600**	P G ..	X	0.40	—
Elen	FAXQ	—	Navy	300, **600**	P G ..	N	0.05	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
FRANCE—*contd.*							Francs.	Francs.	
Elisabeth Marie	FAK	150	Soc. Gén. d'Armement Maritime	300, **600**	P G	X	0.40	—	
Emile Baudot	FZK	250	Compagnie Générale de Radio-télégraphie	300, **600**	P G	N	0.40	—	
Emilie L. D. [1]	FYN	—	Cie f. des Câbles Télégraphiques	—	P G	X	0.40	—	
Emmanuella[1]	FHE	200	—	300, **600**	P G	X	0.40	—	
Emporté	FBPO	—	Navy	300, **600**	P G	N	0.05	—	
Engageante	FBNT	—	Navy	300, **600**	P G	N	0.05	—	
Enseigne-Henry	FBEY	—	Navy	300, **600**	P G	N	0.05	—	
Enseigne-Roux	FBXR	—	Navy	300, **600**	P G	N	0.05	—	
Eole [1]	FRE	—	Soc. les Affréteurs Reunis	—	P G	X	0.40	—	
Eparges (Les)	FALE	—	Navy	300, **600**	P G	N	0.05	—	
Epernay	FBJE	—	Navy	300, **600**	P G	N	0.05	—	
Epieu	FBME	—	Navy	300, **600**	P G	N	0.05	—	
Epinal	FAQE	—	Navy	300, **600**	P G	N	0.05	—	
Erable	FBCE	—	Navy	300, **600**	P G	N	0.05	—	
Erdre [1]	FAA	300	Cie. Nantaise de Nav. à Vapeur	300, **600**	P G	X	0.40	—	
Ernest	FARN	—	Navy	300, **600**	P G	N	0.05	—	
Ernest-Renan	FAHR	—	Navy	300, **600**	P G	N	0.05	—	
Eros FYS	FYS	150	Soc. les Affréteurs	300	P G	N	—	—	
Escaut	FAZE	—	Navy	300, **600**	P G	N	0.05	—	
Escopette	FBQE	—	Navy	300, **600**	P G	N	0.05	—	
Espagne FTE [1]	FTE	300	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
Espagne FVE [3]	FVE	250	Cie Gén. des Transports Mar., à Vap.	300, **600**	P G	N	0.40	—	
Espiègle FBEP	FBEP	—	Navy	300, **600**	P G	N	0.05	—	
Étourdi	FBXE	—	Navy	300, **600**	P G	N	0.05	—	
Eugène Grosos [1]	FLG	150	Cie Havraise Péninsulaire de Nav. à Vap.	300, **600**	P G	N	0.40	—	
Eugène Péreire [1, 7]	FGP	200	Cie Gén. Transatlantique	300, **600**	P G	N	0.10	—	
Euler	FAUL	—	Navy	300, **600**	P G	N	0.05	—	
Europe FCU [1]	FCU	300	Cie des Chargeurs Réunis	300, **600**	P G	N	0.40	—	
Éveillé	FBEV	—	Navy	300, **600**	P G	N	0.05	—	
Faisan	FBAX	—	Navy	300, **600**	P G	N	0.05	—	
Fanfare	FBIX	—	Navy	300, **600**	P G	N	0.05	—	
Fanion	FBNI	—	Navy	300, **600**	P G	N	0.05	—	
Fantasque	FAXV	—	Navy	300, **600**	P G	N	0.05	—	
Faraday FARY	FARY	—	Navy	300, **600**	P G	N	0.05	—	
Farouche	FAJV	—	Navy	300, **600**	P G	N	0.05	—	
Faucon	FADY	—	Navy	300, **600**	P G	N	0.05	—	

Fauconneau	FBKU	—	Navy	300, 600	P G ..	N	0.05	—
Favori	FAHW	—	Navy	300, 450, 600	P G ..	X	0.40	—
Félix Fraissinot [1] ..	FPF	200	Fraissinet et Cie, Marseilles	300, 600	P G ..	N	0.40	—
Félix-Touache [1] ..	FXF	200	Cie de Nav. Mixte à Vap. ..	300, 600	P G ..	N	0.05	—
Fier	FBZY	—	Navy	300, 450, 600	P G ..	X	0.40	—
Figuig UAB [1]	UAE	200	Cie Générale Transatlantique ..	—	P G ..	N	0.40	—
Finistère [1]	FQF	—	Cie Gén. Transatlantique	300, 600	P G ..	N	0.40	—
Flambant	FBKL	—	Navy	300, 600	P G ..	N	0.05	—
Flandre FGF [1]	FGF	300	Cie Gén. Transatlantique ..	300, 600	P G ..	N	0.40	—
Flandre FKN	FKN	—	Cie des Chargeurs f. Plisson & Cie	—	P G ..	X	0.40	—
Flandre FVD [6]	FVD	—	Soc. Gén. des Transports Maritime à Vap.	—	P G ..	N	0.10	—
Forfait	FAOR	—	Navy	300, 600	P G ..	N	0.05	—
Formosa FVF [8] ..	FVF	250	Soc. Gén. des Transports Maritime à Vap.	300, 600	P G ..	N	0.40	—
Formose [1]	FSF	—	Cie des Chargeurs Réunis	—	P G ..	N	0.40	—
Forte de Douaumont [1]	FSU	200	Cie des Chargeurs Réunis ..	300, 600	P G ..	N	0.40	—
Fort de Souville [1] ..	FSS	200	Cie des Chargeurs Réunis ..	300, 600	P G ..	N	0.40	—
Fort de Troyon [1] ..	FSN	200	Cie des Chargeurs Réunis ..	300, 600	P G ..	N	0.40	—
Fort de Vaux	FSV	—	Cie des Chargeurs Réunis	—	P G ..	N	0.40	—
Foudre	FADU	—	Navy	300, 600	P G ..	N	0.05	—
Fouguese	FALX	—	Navy	300, 600	P G ..	N	0.05	—
Fourrageur	FAQX	—	Navy	300, 600	P G ..	N	0.05	—
Fracas	FBHZ	—	Navy	300, 600	P G ..	N	0.05	—
France FAXN	FAXN	—	Navy	300, 600	P G ..	N	0.05	—
France FDF	FDF	250	—	300, 600	P G ..	N	0.40	—
France FHF	FHF	300	S.A. des Navires Mixtes, Prentout, Leblond, Leroux et Cie	300, 600, 1,800	P G ..	X	0.40	—
France FTZ [1]	FTZ	300	Cie Gén. Transatlantique ..	300, 600	P G ..	N	0.40	—
France FZA (La) [1] [5] ..	FZA	150	State Railway Administration ..	300, 600	P G ..	X	0.15	3.50
Francis-Garnier ..	FBXG	—	Navy	300, 600	P G ..	N	0.05	—
Francisque	FBWQ	—	Navy	300, 600	P G ..	N	0.05	—
Frank Delmas [8] ..	FWK	—	Delmas frères	—	P G ..	X	0.40	—
Franklin FAKL ..	FAKL	—	Navy	300, 600	P G ..	N	0.05	—
Frêne	FAWY	—	Navy	300, 600	P G ..	N	0.05	—
Friedland [1]	UKD	200	Victor Leclaire Huret, Boulogne-sur-Mer	300, 600	P G ..	X	0.40	—
Frimaire	FAMR	—	Navy	300, 600	P G ..	N	0.05	—
Frondeur	FAZV	—	Navy	300, 600	P G ..	N	0.05	—
Fulgurant	FAGU	—	Navy	300, 600	P G ..	N	0.05	—
Fulton FAUO	FAUO	—	Navy	300, 600	P G ..	N	0.05	—
Gabriella [1]	FHG	200	Fourny et Cie	300, 600	P G ..	X	0.40	—
Gafsa [8]	FWG	—	Delmas frères	—	P G ..	X	0.40	—
Garonna [1]	FSG	300	Cie de Nav. Sud-Atlantique ..	300, 600	P G ..	N	0.40	—
Garonne FAKG ..	FAKG	—	Navy	300, 600	P G ..	N	0.05	—
Garonne FTG [1] ..	FTG	250	Cie Gén. Transatlantique ..	300, 600	P G ..	N	0.40	—
Gaston Rivier	FABK	—	Navy	300, 600	P G ..	N	0.05	—
Gâtinais [1]	UCU	350	Cie Générale Transatlantique ..	300, 450, 600	P G ..	X	0.40	—
Gaulois [1]	FYX	150	Emile Altazin & Cie	300, 600	P G ..	X	0.40	—
Gélinotte	FBLG	—	Navy	300, 600	P G ..	N	0.05	—
General Doods [1] ..	FBQ	200	Maurel et Prom, Bordeaux ..	300, 600	P G ..	X	0.40	—
Genevieve [1]	UKH	200	Soc. Dieppoise d'Armement à la Pêche	300, 600	P G ..	X	0.40	—
Géorgie [1]	FQG	200	Cie Gén. Transatlantique ..	300, 600	P G ..	N	0.40	—
Gergovia [1]	FJI	—	Cie f. de Nav. à Vap. Cyprien Fabre & Cie	—	P G ..	N	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
FRANCE—*contd.*							Francs.	Francs.	
Ghislaine [2]	FBS	—	F. Bouet	—	P G	X	0.40	—	
Gladiateur	FADG	—	Navy	300, **600**	P G	N	0.05	—	
Glaïeul	FAHG	—	Navy	300, **600**	P G	N	0.05	—	
Glaive	FBGV	—	Navy	300, **600**	P G	N	0.05	—	
Gloire	FAIG	—	Navy	300, **600**	P G	N	0.05	—	
Glycine	FAGY	—	Navy	300, **600**	P G	N	0.05	—	
Goliath FAGO	FAGO	—	Navy	300, **600**	P G	N	0.05	—	
Gorgone	FAGR	—	Navy	300, **600**	P G	N	0.05	—	
Gracieuse	FBGS	—	Navy	300, **600**	P G	N	0.05	—	
Grandlieu [1]	FAG	—	Cie Nantaise de Nav. à Vapeur	—	P G	N	0.40	—	
Granit	FBGN	—	Navy	300, **600**	P G	N	0.05	—	
Graville [1]	FXL	200	Cie Gén. Transatlantique	300, **600**	P G	X	0.40	—	
Graziella UKG [1]	UKG	180	René Petit, Dieppe	300, **600**	P G	X	0.40	—	
Grès	FAWG	—	Navy	300, **600**	P G	N	0.05	—	
Grondeur	FBGR	—	Navy	300, **600**	P G	N	0.05	—	
Guebwiller [1]	FDC	200	Société des Armateurs Français	300, **600**	P G	X	0.40	—	
Guéthary	FKG	—	Cie des Chargeurs f. Plisson et Cie	—	P G	X	0.40	—	
Gueydon	FABG	—	Navy	300, **600**	P G	N	0.05	—	
Guichen	FAUG	—	Navy	300, **600**	P G	N	0.05	—	
Guyane [1]	FQY	200	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
Hache	FBQH	—	Navy	300, **600**	P G	N	0.05	—	
Haïti [1]	FAHL	250	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
Hâleur	FOH	—	Navy	300, **600**	P G	N	0.05	—	
Halicor [1]	UKF	150	Vve Cantagrel & Fils	300, **600**	P G	X	0.40	—	
Hamelin	FBHA	—	Navy	300, **600**	P G	N	0.05	—	
Hardi	FBWH	—	Navy	300, **600**	P G	N	0.05	—	
Harle [1]	FBW	150	Soc. les Chalutiers de La Rochelle	300, 450, **600**	P G	X	0.40	—	
Harpon	FBZH	—	Navy	300, **600**	P G	N	0.05	—	
Havraise [1]	FLH	150	Cie Havraise Péninsulaire de Nav. à Vap.	300, **600**	P G	N	0.40	—	
Helengallus [1]	UHI	250	Soc. Mar. et Commerciale du Pacifique	300, **600**	P G	X	0.40	—	
Hendaye	FKY	—	Cie des Chargeurs f. Plisson & Cie	—	P G	N	0.40	—	
Henriette FBHI	FBHI	—	Navy	300, **600**	P G	N	0.05	—	
Henriette FHH [1]	FHH	150	A. & G. Vidor fils	300, **600**	P G	N	0.40	—	
Henri-Fournier	FAHU	—	Navy	300, **600**	P G	N	0.05	—	
Henry Fraissinet [1]	FRH	—	Fraissinet & Cie	—	P G	X	0.40	—	
Hercule [12]	FIE	300	Soc. les Affréteurs Réunis	300, **600**	P G	N	0.40	—	
Hermione FAHO	FAHO	—	Navy	300, **600**	P G	N	0.05	—	

Héron II	[illegible]	—	Navy	300, 600	P G	N	[illegible]	—
Héros	FAJH	—	Navy	300, 600	P G	N	0.05	—
Hêtre	FBHT	—	Navy	300, 600	P G	N	0.05	—
Hippopotame	FBHP	—	Navy	300, 600	P G	N	0.05	—
Homard	FBHM	—	Navy	300, 600	P G	X	0.40	—
Homécourt	FKH	—	Cie des Chargeurs f. Plisson & Cie	—	P G	N	0.40	—
Honduras [1]	FTU	250	Cie Gén. Transatlantique	300, 600	P G	N	0.05	—
Hova	FBHO	—	Navy	300, 600	P G	N	0.40	—
Hudson [1]	FTH	250	Cie Gén. Transatlantique	300, 600	P G	N	0.05	—
Huron FABU	FABU	—	Navy	300, 600	P G	N	0.05	—
Hussard	FBHU	—	Navy	300, 600	P G	X	0.40	—
Hyppolite Worms	FWY	—	Worms & Cie	—	P G	N	0.10	—
Ibéria [1, 6]	FRB	200	Fraissinet & Cie	300, 600	P G	N	0.40	—
Ile de France [3]	FVI	250	Soc. Gén. des Transports Maritimes à Vap.	300, 600	P G	N	0.40	—
Ile de la Réunion [1]	FLN	150	Cie Havraise Péninsulaire de Nav. à Vap.	300, 600	P G	N	0.40	—
Imérina [1]	FIM	250	Cie des Messageries Maritimes	300, 600	P G	N	0.40	—
Impétueuse	FBJI	—	Navy	300, 600	P G	N	0.05	—
Inca FBIK	FBIK	—	Navy	300, 600	P G	N	0.05	—
Inconstant FBIC	FBIC	—	Navy	300, 600	P G	N	0.05	—
Inés FHZ [1]	FHZ	200	Fourny & Cie	300, 600	P G	X	0.40	—
Infatigable	FAXI	—	Navy	300, 600	P G	N	0.05	—
Intrépide	FBWI	—	Navy	300, 600	P G	N	0.05	—
Ionie [1]	FPO	200	N. Paquet & Cie	300, 600	P G	N	0.40	—
Ipéca	FBQI	—	Navy	300, 600	P G	N	0.05	—
Irouléguy	FKI	—	Cie des Chargeurs f. Plisson & Cie	—	P G	N	0.40	—
Iskheul	FAVI	—	Navy	300, 600	P G	N	0.05	—
Ispahan [1]	FIH	—	Cie des Messageries Maritimes	—	P G	N	0.40	—
Italie FVW	FVW	250	Soc. Gén. des Transports Maritimes à Vapeur	300, 600	P G	N	0.40	—
Jacques Cartier [1]	FTJ	300	Cie Gén. Transatlantique	300, 600	P G	X	0.40	—
Jacques-Coeur	FAJC	—	Navy	300, 600	P G	N	0.05	—
Jacques Fraissinet [1]	FRJ	200	Fraissinet & Cie	300, 600	P G	X	0.40	—
Jade [2]	FWJ	—	Cie F. de Marine et de Commerce	—	P G	X	0.40	—
Janine [1]	UMD	200	Soc. Aux. d'Importation et de Transport	300, 600	P G	X	0.40	—
Jarlot [1]	FPL	—	N. Paquet & Cie	—	P G	N	0.40	—
Jean-Bart	FAGJ	—	Navy	300, 600	P G	N	0.05	—
Jeanne d'Arc FAMJ	FAMJ	—	Navy	300, 600	P G	N	0.05	—
Jeanne d'Arc FQJ [1, 7]	FQJ	—	Cie Gén. Transatlantique	—	P G	N	0.10	—
Jeanne et Geneviève	FAJG	—	Navy	300, 600	P G	N	0.05	—
Jeanne Marie UKA [1]	UKA	200	Fourny et Cie, Boulogne-sur-Mer	300, 600	P G	X	0.40	—
Jeannot [1]	FHJ	200	Fourny & Cie	300, 600	P G	X	0.40	—
Jean Stern [1]	FIP	300	Soc. les Affréteurs Réunis	300, 600	P G	X	0.40	—
Joessel	FAJO	—	Navy	300, 600	P G	N	0.05	—
Joveuse	FBJY	—	Navy	300, 600	P G	N	0.05	—
Jubarte [1]	UKP	180	Gabriel Trousselle	300, 600	P G	X	0.40	—
Jules-Ferry	FAYJ	—	Navy	300, 600	P G	N	0.05	—
Jules Henry [1]	FBI	600	Vimont & Cie	300, 600	P G	X	0.40	—
Jules-Michelet	FAJM	—	Navy	300, 600	P G	N	0.05	—
Jupiter FBJ [1]	FBJ	350	Louis Dero, Le Havre	300, 600	P G	X	0.40	—
Jupiter FIL [13]	FIL	300	Soc. les Affréteurs Réunis	300, 600	P G	N	0.40	—
Jurien de la Gravière	FAIJ	—	Navy	300, 600	P G	N	0.05	—
Justice	FAJU	—	Navy	300, 600	P G	N	0.05	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
FRANCE—*contd.*							Francs.	Francs.	
Kabyle	FBKY	—	Navy	300, **600**	P G	N	0.05	—	
Kantara (El) [1]	FNK	300	Cie des Messageries Maritimes	300, **600**	P G	N	0.40	—	
Kouang-Si [1]	FIG	200	Cie des Messageries Maritimes	300, **600**	P G	X	0.40	—	
Laborieux	FAJL	—	Navy	300, **600**	P G	N	0.05	—	
Labrador FYD [1]	FYD	—	Joseph Huret	—	P G	N	0.40	—	
La Fayette [1]	FGE	300	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
La Fontaine [3]	FWO	—	Delmas frères	—	P G	X	0.40	—	
Lagrange	FALG	—	Navy	300, **600**	P G	N	0.05	—	
La Hire	FBVH	—	Navy	300, **600**	P G	N	0.05	—	
Lamentin [1]	FQL	—	Cie Gén. Transatlantique	—	P G	N	0.40	—	
Lamotte-Picquet	FAMP	—	Navy	300, **600**	P G	N	0.05	—	
Lamoriciere [1] [6]	FXK	300	Cie Générale Transatlantique	300, 450, **600**	P G	X	0.10	—	
La Mouette [1]	UKM	250	Fourmentin Avisse et Cie	300, **600**	P G	X	0.40	—	
Lansquenet	FBLQ	—	Navy	300, **600**	P G	N	0.05	—	
Lantana	FBLN	—	Navy	300, **600**	P G	N	0.05	—	
La Pérouse [1]	FTD	300	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
Lapérousse	FBLP	—	Navy	300, **600**	P G	N	0.05	—	
Lapeyrouse [1]	FWL	—	Cie Gén. Armement Maritime	—	P G	N	0.40	—	
Laplace FALP	FALP	—	Navy	300, **600**	P G	N	0.05	—	
La Sambre FBV [1]	FBV	300	Maurel Frères	300, 450, **600**	P G	X	0.40	—	
Lassigny	FBLS	—	Navy	300, **600**	P G	N	0.05	—	
Lavardin [1]	FBG	150	Compagnie Générale de Radiotélégraphie	300, **600**	P G	X	0.40	—	
Lavoisier	FAVO	—	Navy	300, **600**	P G	N	0.05	—	
Léopold L.D. [1]	FYL	350	L. Dreyfus & Cie	300, **600**	P G	X	0.40	—	
Le Verrier	FAVR	—	Navy	300, **600**	P G	N	0.05	—	
Liamone [6]	FRA	200	Fraissinet & Cie	300, **600**	P G	N	0.10	—	
Liberté [1]	UKV	150	Soc. Anonyme de Pêche et d'Armement de l'Ouest	300, **600**	P G	X	0.40	—	
Lieutenant Missiessy [1]	FIY	—	Cie des Messageries Maritimes	—	P G	N	0.40	—	
Liévin	FALI	—	Navy	300, **600**	P G	N	0.05	—	
Liger [1]	FSL	300	Cie de Nav. Sud-Atlantique	300, **600**	P G	N	0.40	—	
Lillois [1]	FHP	200	Fourny & Cie	300, **600**	P G	X	0.40	—	
Limoges [1]	FAV	200	Soc. Mar. aux de Transports	300, **600**	P G	N	0.04	—	
Lobélia	FBLO	—	Navy	300, **600**	P G	N	0.05	—	
Loriot	FAQL	—	Navy	300, **600**	P G	N	0.05	—	
Loki UKT [1]	UKT	200	Laurens, Cherbourg	300, **600**	P G	X	0.40	—	
Lorraine FALN	FALN	—	Navy	300, **600**	P G	N	0.05	—	
Lorraine FTL (La) [1]	FTL	300	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	

Lotus [1]	FML	300	Cie des Messageries Maritimes	300, 600	P G	N	0.40	—	
Louis Fraissinet [1]	FRR	200	Fraissinet & Cie	300, 600	P G	X	0.40	—	
Loup	FBOL	—	Navy	300, 600	P G	N	0.05	—	
Loup-Cervier	FBLV	—	Navy	300, 600	P G	N	0.05	—	
Louqsor [1]	FNL	300	Cie des Messageries Maritimes	300, 600	P G	—	0.40	—	
Lunéville	FALU	—	Navy	300, 600	P G	N	0.05	—	
Luronne	FBLU	—	Navy	300, 600	P G	N	0.05	—	
Lutetia [1]	FST	300	Cie de Nav. Sud-Atlantique	300, 600	P G	N	0.04	—	
Lutteur	FAML	—	Navy	300, 600	P G	N	0.05	—	
Macoris UDI [1]	UDI	200	Cie Générale Transatlantique	300, 600	P G	X	0.40	—	
Madeline [1]	UHA	200	Jean Huret et Cie	300, 600	P G	X	0.40	—	
Madonna [1]	FJM	200	Cie f. de Nav. à Vap. Cyprien Fabre & Cie	300, 600	P G	N	0.40	—	
Magon	FBTM	—	Navy	300, 600	P G	N	0.05	—	
Magny [1]	FWD	300	Gillet & fils.	300, 600	P G	X	0.40	—	
Maine FVM [1 6]	FVM	—	Soc. Gén. des Transports Mar. à Vapeur	—	P G	N	0.10	—	
Malicieuse	FBVM	—	Navy	300, 600	P G	N	0.05	—	
Malte [1]	FCM	300	Cie des Chargeurs Réunis	300, 600	P G	N	0.40	—	
Mameluck	FBLK	—	Navy	300, 600	P G	N	0.05	—	
Mammouth	FBMH	—	Navy	300, 600	P G	N	0.05	—	
Manche (La)	FYY	—	Soc. de l'Ecole Pratique de Pêche	—	P G	X	0.40	—	
Mangini	FBMG	—	Navy	300, 600	P G	N	0.05	—	
Manouba [1 7]	FXB	200	Cie de Nav. Mixte à Vap.	300, 600	P G	N	0.10	—	
Mansourah [1 7]	FXZ	150	Cie de Nav. Mixte à Vap.	300, 600	P G	N	0.10	—	
Marbre	FBSM	—	Navy	300, 600	P G	N	0.05	—	
Marcassin	FBWM	—	Navy	300, 600	P G	N	0.05	—	
Maréchal Bugeaud [1 6]	FGY	200	Cie Gén. Transatlantique	300, 600	P G	N	0.10	—	
Margaux	FWX	—	Worms & Cie	—	P G	X	0.40	—	
Marguerite UKB [1]	UKB	200	Fourny et Cie, Boulogne-sur-Mer	300, 600	P G	X	0.40	—	
Marguerite VI	FAPM	—	Navy	300, 600	P G	N	0.05	—	
Marguerite Marie [13]	FBO	200	Soc. la Pêche Française	—	—	—	—	—	
Marguerite Marie II [1]	FBM	—	Soc. Nouvelle des Pêcheries à Vap.	—	P G	X	0.40	—	
Marie Rose FHM [1]	FHM	150	A. & G. Vodor, Fils.	300, 600	P G	X	0.40	—	
Marie-Stella [1]	FHS	200	Fourny & Cie	300, 600	P G	X	0.40	—	
Marne FBH [1]	FBH	300	Soc. des Usines Métallurgiques de la Basse-Loire	300, 600	P G	X	0.4[illegible]	—	
Marne FBZM	FBZM	—	Navy	300, 600	P G	N	0.05	—	
Maroc [1]	FYM	150	Joseph Huret	300, 600	P G	X	0.40	—	
Marocain	FBOC	—	Navy	300, 600	P G	N	0.05	—	
Marsa (La) [1 6]	FXR	200	Cie de Nav. Mixte à Vap.	300, 600	P G	X	0.10	—	
Marseillaise	FADM	—	Navy	300, 600	P G	N	0.05	—	
Marthe [1]	FDN	150	Soc. les Chalutiers de la Rochelle	300, 600	P G	X	0.40	—	
Martinique [1]	FTM	250	Cie Gén. Transatlantique	300, 600	P G	N	0.40	—	
Maryland FXD [1]	FXD	200	Cie Générale Transatlantique	300, 600	P G	X	0.40	—	
Massilia FSK	FSK	450	Cie de Nav. Sud-Atlantique	300, 600	P G	N	0.40	—	
Massue	FBMU	—	Navy	300, 600	P G	N	0.05	—	
Mastodonte	FAMN	—	Navy	300, 600	P G	N	0.05	—	
Mauritanie [1]	FYT	—	Joseph Huret	—	P G	X	0.40	—	
Mauviette	FAQM	—	Navy	300, 600	P G	N	0.05	—	
Mécanicien principal Lestin	FBJL	—	Navy	300, 600	P G	N	0.05	—	
Meg	FAGM	—	Navy	300, 600	P G	N	0.05	—	
Méhari	FBGM	—	Navy	300, 600	P G	N	0.05	—	
Meinam [1]	FMI	250	Cie des Messageries Maritimes	300, 600	P G	N	0.40	—	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
FRANCE—*contd.*							Francs.	Francs.	
Melbourne FNM [1]	FNM	300	Cie des Messageries Maritimes	300, **600**	P G	N	0.40	—	
Mendoza [3]	FVQ	450	Soc. Générale des Transports Maritimes à Vapeur	300, **600**	P G	0000 to 0200 0400 to 1000 1200 to 1800 2000 to 2200	0.40	—	
Meurthe [1]	FPQ	—	N. Paquet & Cie	—	P G	N	0.40	—	
Meuse	FBQM	—	Navy	300, **600**	P G	N	0.05	—	
Mexico FTX [1]	FTX	250	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
Michel et Renée	FAUM	—	Navy	300, **600**	P G	N	0.05	—	
Michigan FQQ [1]	FQQ	300	Cie Générale Transatlantique	300, **600**	P G	X	0.40	—	
Milan	FAWM	—	Navy	300, **600**	P G	N	0.05	—	
Min UCR [1]	UCR	300	Cie des Messageries Maritimes	300, 450, **600**	P G	X	0.40	—	
Mingrélie [1]	FPX	150	N. Paquet & Cie	300, **600**	P G	N	0.40	—	
Miquelon	FWM	100	Soc. de la Morue f. et Sécheries de Fécamp	300, **600**	P G	X	0.40	—	
Mississipi [1]	FGI	160	Cie Gén. Transatlantique	300, **600**	P G	X	0.40	—	
Missouri FXU [1]	FXU	200	Cie Générale Transatlantique	300, **600**	P G	X	0.40	—	
Mistral	FBML	—	Navy	300, **600**	P G	N	0.05	—	
Mohican	FAMO	—	Navy	300, **600**	P G	N	0.05	—	
Moïse [1 7]	FGS	200	Cie Gén. Transatlantique	300, **600**	P G	N	0.10	—	
Mondement	FBMO	—	Navy	300, **600**	P G	N	0.05	—	
Mont Agel [3]	FVR	200	Soc. Gén. des Transports Maritimes à Vapeur	300, **600**	P G	X	0.40	—	
Montana FXA [1]	FXA	300	Cie. Générale Transatlantique	300, **600**	P G	X	0.40	—	
Montauban [1]	UMB	200	Soc. Maritime aux. de Transports	300, **600**	P G	X	0.40	—	
Montcalm FAHM	FAHM	—	Navy	300, **600**	P G	N	0.05	—	
Mont-Cenis	FVC	200	Soc. Gén. des Transports Maritimes à Vap.	300, **600**	P G	X	0.40	—	
Mont Cervin	FVV	200	Soc. Gén. des Transports Maritimes à Vap.	300, **600**	P G	X	0.40	—	
Monte d'Oro [3]	FDD	200	Soc. An. de Transport et de Pêche	300, **600**	P G	X	—	—	
Montgolfier	FAOM	—	Navy	300, **600**	P G	N	0.05	—	
Montjoie [1]	FDQ	200	Soc. des Aciéries de Paris et d'Outreau	300, **600**	P G	X	0.40	—	
Mont Kemmel [3]	UFF	200	Soc. Gén. des Transports Maritimes à Vap.	300, **600**	P G	X	0.40	—	
Montmirail	FBMI	—	Navy	300, **600**	P G	N	0.05	—	
Mont-Pelvoux	FVX	200	Soc. Gén. des Transports Maritimes à Vap.	300, **600**	P G	X	0.40	—	

Mont-Ventoux [1]	FQM	150	[illegible]tique	[illegible]	P G	N	0.4[illegible]	—
Moqueuse	FBXM	—	Navy	300, 600	P G	N	0.05	—
Morbihan [1]	FVY	200	Cie Gén. Transatlantique	300, 600	P G	X	0.40	—
Mortier	FBNM	—	Navy	300, 600	P G	N	0.05	—
Mosai [1]	FBP	300	Devès, Chaumet & Cie.	300, 450, 600	P G	X	0.40	—
Mouflon	FANM	—	Navy	300, 600	P G	N	0.05	—
Moulouya [7]	FXY	—	Cie de Nav. Mixte à Vap.	—	P G	N	0.10	—
Mustapha II [1,7]	FXM	200	Cie de Nav. Mixte à Vap.	300, 600	P G	N	0.10	—
Nancy	FBNA	—	Navy	300, 600	P G	N	0.05	—
Nantes [1]	FRX	—	Soc. Maritime aux de Transports	—	P G	N	0.40	—
Narval	FAZN	—	Navy	300, 600	P G	N	0.05	—
Navarre [1]	FTN	250	Cie Gén. Transatlantique	300, 600	P G	N	0.40	—
Némésia	FBZN	—	Navy	300, 600	P G	N	0.05	—
Néra [1]	FNN	300	Cie des Messageries Maritimes	300, 600	P G	N	0.40	—
Néréide	FARI	—	Navy	300, 600	P G	N	0.05	—
Newhaven FZH [8]	FZH	150	State Railway Administration	300, 600	P G	X	0.15	3.50
Newton FAWT	FAWT	—	Navy	300, 600	P G	N	0.05	—
Niagara FTB [1]	FTB	300	Cie Gén. Transatlantique	300, 600	P G	N	0.40	—
Nicolas Norbert [1]	FYR	200	Mory et Cie	300, 600	P G	N	0.40	—
Nièvre (La) [1,7]	FGN	150	Cie Gén. Transatlantique	300, 600	P G	N	0.10	—
Nora Hugo Stinnes II [1]	UKW	200	Soc. Anonyme de Gérance et d'Armement	300, 600	P G	X	0.40	—
Nord [2,4]	FZN	200	Cie des Chemin de fer du Nord	300, 600	P G	N	0.15	—
Normand	FMM	300	Cie des Messageries Maritimes	300, 600	P G	N	0.40	—
Normandie [1]	FBC	300	Soc. les Pêcheries de Fécamp	300, 600	P G	X	0.40	—
Notre-Dame de la Mer [1]	FZM	150	Soc. des Œuvres de Mer	300, 600	P G	X	0.40	4.00
Notre-Dame de Lourds [1]	FHB	—	Fourny & Co.	—	P G	X	0'40	—
Notre-Dame des Dunes [1]	FYV	150	Christiains & Bourgain Frères	300. 600	P G	X	0.40	—
Notre-Damed'Espérance [1]	FYE	150	Delpierre & Fils	300, 600	P G	X	0.40	—
Noun [1]	FPY	—	N. Paquet & Cie	—	P G	X	0.40	—
Numidia [1,8]	FRN	200	Fraissinet & Cie	300, 600	P G	N	0.10	—
Obusier	FBOS	—	Navy	300, 600	P G	N	0.05	—
O'Byrne	FABY	—	Navy	300, 600	P G	N	0.05	—
Océan FYO [1]	FYO	300	Armond Coppin	300, 600	P G	X	0.40	—
Océanien [1]	FNO	300	Cie des Messageries Maritimes	300, 600	P G	N	0.40	—
Octant	FABS	—	Navy	300, 600	P G	N	0.05	—
Oise FXE [1]	FXE	200	Cie. Gén. Transatlantique	300, 450, 600	P G	X	0.40	—
Oise FBOI	FBOI	—	Navy	300, 600	P G	N	0.05	—
Ondine II	FBQY	—	Navy	300, 600	P G	N	0.05	—
Ontario FXI [1]	FXI	200	Cie. Gén. Transatlantique	300, 600	P G	X	0.40	—
Opiniâtre	FBOP	—	Navy	300, 600	P G	N	0.05	—
Orage	FBJR	—	Navy	300, 600	P G	N	0.05	—
Orégon FQR [1]	FQR	150	Cie Gén. Transatlantique	300, 600	P G	N	0.40	—
Orénoque [1]	FMO	250	Cie des Messageries Maritimes	300, 600	P G	N	0.40	—
Orient UHB [1]	UHB	200	Soc. f. des Pêcheries à Vap.	300, 600	P G	X	0.40	—
Oriflamme	FBQO	—	Navy	300, 600	P G	N	0.05	—
Orléans FRW [1]	FRW	—	Soc. Mar. aux de Transports	—	P G	N	0.40	—
Orme	FBQN	—	Navy	300, 600	P G	N	0.05	—
Orne [1]	FQO	250	Cie Gén. Transatlantique	300, 600	P G	N	0.40	—
Oudjda [1,7]	FGQ	—	Cie Gén. Transatlantique	—	P G	N	0.10	—
Ouessant [1]	FCW	300	Cie des Chargeurs Réunis	300, 600	P G	N	0.40	—
Ouragan [1]	UHM	160	Soc. Maritime Nationale	300, 600	P G	X	0.40	—
Outreau [1]	FDT	200	Soc. des Aciéries de Paris et d'Outreau	300, 600	P G	X	0.4	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
FRANCE—*contd.*							Francs.	Francs.	
Pacifique [1]	FNW	300	Cie des Messageries Maritimes	300, **600**	P G	N	0.40	—	
Paon	FBPN	—	Navy	300, **600**	P G	N	0.05	—	
Paris FASP	FASP	—	Navy	300, **600**	P G	N	0.05	—	
Pas-de-Calais [3 4]	FZP	200	Cie du Chemin de Fer du Nord	300, **600**	P G	N	0.15	—	
Patria FJP [1]	FJP	200	Cie f. de Nav. à Vap Cyprien Fabre et Cie	300, **600**	P G	N	0.40	—	
Patrie FAGP	FAGP	—	Navy	300, **600**	P G	N	0.05	—	
Patrie FHX [1]	FHX	200	E. Louvet	300, **600**	P G	X	0.40	—	
Paul-Chailley	FACP	—	Navy	300, **600**	P G	N	0.05	—	
Paul Lecat [1]	FNP	300	Cie des Messageries Maritimes	300, **600**	P G	N	0.40	—	
Peau-Rouge	FAPG	—	Navy	300, **600**	P G	N	0.05	—	
Pei-Ho [1]	FMP	300	Cie des Messageries Maritimes	300, **600**	P G	N	0.40	—	
Pélion [1 6]	FRP	200	Fraissinet & Cie	300, **600**	P G	N	0.10	—	
Peronne	FAPE	—	Navy	300, **600**	P G	N	0.05	—	
Pérou [1]	FTP	250	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
Persépolis [1]	FNV	300	Cie des Messageries Maritimes	300, **600**	P G	N	0.40	—	
Pertuisane	FBPE	—	Navy	300, **600**	P G	N	0.05	—	
Peuplier	FBPL	—	Navy	300, **600**	P G	N	0.05	—	
Phocéen	FDP	150	S. A. Provencole de Remorquage	300. **600**	P G	N	0.40	—	
Phrygie [1]	FPJ	250	N. Paquet & Cie	300, **600**	P G	N	0.40	—	
Phryné	UGR	200	Soc. Maritime aux. de Transports, Nantes	300, **600**	P G	X	0.40	—	
Picorre [1]	FBR	200	Les Chalutiers de la Rochelle	300, **600**	P G	X	0.40	—	
Pierre-Callot	FAPC	—	Navy	300, **600**	P G	N	0.05	—	
Pierrier	FBPI	—	Navy	300, **600**	P G	N	0.05	—	
Pigeon FAOP	FAOP	—	Navy	300, **600**	P G	N	0.05	—	
Pinson I	FBIP	—	Navy	300, **600**	P G	N	0.05	—	
Pintade	FAYP	—	Navy	300, **600**	P G	N	0.05	—	
Pioche	FAHP	—	Navy	300, **600**	P G	N	0.05	—	
Pique	FBUP	—	Navy	300, **600**	P G	N	0.05	—	
Plata FVL	FVL	250	Soc. Gén. des Transports Mar. à Vap.	300, **600**	P G	N	0.40	—	
P.L.M. 7 [1]	UHR	200	Soc. Nat. d'Affrétements	300, **600**	P G	X	0.40	—	
P.L.M. 8 [1]	UHS	200	Soc. Nat. d'Affrétements	300, **600**	P G	X	0.40	—	
P.L.M. 10 [1]	UHT	600	Société Nationale d'Affrétement	300, **600**	P G	X	0.40	—	
Pluton	FAPU	—	Navy	300, **600**	P G	N	0.05	—	
Poignard	FBKP	—	Navy	300, **600**	P G	N	0.05	—	
Poitiers [3]	FZI	—	State Railways Administration	—	P G	X	0.15	3.50	
Polyphème	FBGP	—	Navy	300, **600**	P G	N	0.05	—	

[illegible]	[illegible]	—	[illegible] & Cie	[illegible]	P G	X	0.40	—
[illegible]-Canet	[illegible]N	—	[illegible] & Cie		P G	X	0.40	—
[illegible]	[illegible]	300	Cie des Messageries Maritimes	300, 600	P G	N	0.40	—
Portsmouth FZY	FZY	—	State Railways Administration	—	P G	X	0.15	3.50
Portugal FVG	FVG	—	Soc. Gén. des Transports Mar. à Vap.	—	P G	N	0.40	—
Pothuau	FAPO	—	Navy	300, 600	P G	N	0.05	—
Pouyer-Quertier	FZT	300	Cie f. des Câbles Télégraphiques	—	P G	N	0.40	—
Prado	FBNP	—	Navy	300, 600	P G	N	0.05	—
Président-Le-Roy-Lallier	FYQ	—	Cie des Bateaux à Vap. du Nord	—	P G	X	0.40	—
Primauguet	FBPG	—	Navy	300, 600	P G	N	0.05	—
Primevère	FAPR	—	Navy	300, 600	P G	N	0.05	—
Protêt	FBPR	—	Navy	300, 600	P G	N	0.05	—
Provence FABP	FABP	—	Navy	300, 600	P G	N	0.05	—
Provence FAP	FAP	200	Cie de Nav. France-Amérique	300, 600	P G	N	0.40	—
Providence FJB [1]	FJB	300	Cie f. de Nav. à Vap. Cyprien Fabre	300, 600	P G	N	0.40	—
Psyche [1]	UGQ	200	Soc. Maritime aux. de Transports	300, 600	P G	X	0.40	—
Puerto-Rico [1]	FGU	250	Cie Gén. Transatlantique	300, 600	P G	N	0.40	—
Quartz [8]	FWQ	—	Cie f. de Marine et de Commerce	—	P G	X	0.40	—
Quentin-Roosevelt	FAQR	—	Navy	300, 600	P G	N	0.05	—
Radioléine [1]	FXN	150	Cie de Nav. Mixte à Vap.	300, 600	P G	N	0.40	—
Radium [1]	FPK	200	Soc. Anonyme des Anciens Etablissements Ch. Leborgne	300, 600	P G	X	0.40	—
Rafale	FBRL	—	Navy	300, 600	P G	N	0.05	—
Railleuse	FBZR	—	Navy	300, 600	P G	N	0.05	—
Ramier	FBWR	—	Navy	300, 600	P G	N	0.05	—
Rapière	FBVR	—	Navy	300, 600	P G	N	0.05	—
Râteau	FATR	—	Navy	300, 600	P G	N	0.05	—
Rebia [1]	FPI	—	N. Paquet & Cie	—	P G	N	0.40	—
Regnault	FAGL	—	Navy	300, 600	P G	N	0.05	—
Régulus FBQR	FBQR	—	Navy	300, 600	P G	N	0.05	—
Reims	FBRE	—	Navy	300, 600	P G	N	0.05	—
Remiremont	FBRM	—	Navy	300, 600	P G	N	0.05	—
Renard	FBKN	—	Navy	300, 600	P G	N	0.05	—
René	FBRN	—	Navy	300, 600	P G	N	0.05	—
Renée	FAYL	—	Navy	300, 600	P G	N	0.05	—
Renne	FABC	—	Navy	—	P G	N	0.05	
République	FAKR	—	Navy	300, 600	P G	N	0.05	—
Résolue [1 12]	FYU	150	Pierre Lebaudy	300	P G	N	—	—
Revigny	FARV	—	Navy	300, 600	P G	N	0.05	—
Rhin (Le) [1]	FXP	300	Maurel Frères, Bordeaux	300, 600	P G	X	0.40	—
Rhinoceros	FBRH	—	Navy	300, 600	P G	N	0.05	—
Rhône FALR	FALR	—	Navy	300, 600	P G	N	0.05	—
Rhône FXH [1 7]	FXH	250	Cie de Nav. Mixte à Vap.	300, 600	P G	N	0.10	—
Rigel FVT [8]	FVT	250	Soc. Gén. des Transports Mar. à Vap.	300, 600	P G	N	0.40	—
Robuste	FBRU	—	Navy	300, 600	P G	N	0.05	—
Rochambeau [1]	FTR	300	Cie Gén. Transatlantique	300, 600	P G	N	0.40	—
Rochebonne [1]	FDH	150	—	300, 600	P G	X	0.40	—
Rochelle (La) [1]	FQH	160	Cie Gén. Transatlantique	300, 600	P G	X	0.40	—
Roland-Morillot	FARM	—	Navy	300, 600	P G	N	0.05	—
Roma FJR [1]	FJR	250	Cie des Pêcheries Mar. de l'Atlantique	300, 600	P G	X	0.40	—
Romazotti	FAZO	—	Navy	300, 600	P G	N	0.05	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
FRANCE—*contd.*							Francs.	Francs.	
Rorqual [1]	FHQ	150	Poret-Lobez & Cie	300, **600**	P G	X	0.40	—	
Rosemonde [1]	FHR	150	Victor Fourny	300, **600**	P G	X	0.40	—	
Rosita [1]	FHY	150	Victor Fourny	300, **600**	P G	X	0.40	—	
Rouen FZR [6]	FZR	150	State Railways Administration	300, **600**	P G	X	0.15	3.50	
Roussillon [1]	FXV	400	Cie Gén. Transatlantiques	300, **600**	P G	X	0.40	—	
Sabre FBCS	FBCS	—	Navy	300, **600**	P G	N	0.05	—	
Sagaie	FBRS	—	Navy	300, **600**	P G	N	0.05	—	
Sajou	FBSJ	—	Navy	300, **600**	P G	N	0.05	—	
Sakalave	FBKH	—	Navy	300, **600**	P G	N	0.05	—	
Samara [1]	FSM	300	Cie de Nav. Sud-Atlantique	300, **600**	P G	N	0.40	—	
Samson	FASM	—	Navy	300, **600**	P G	N	0.05	—	
Sané	FASN	—	Navy	300, **600**	P G	N	0.05	—	
Sanglier	FBSG	—	Navy	300, **600**	P G	N	0.05	—	
Sans-Souci	FBJS	—	Navy	300, **600**	P G	N	0.05	—	
Sape	FBSA	—	Navy	300, **600**	P G	N	0.05	—	
Sarigue	FBSR	—	Navy	300, **600**	P G	N	0.05	—	
Saverne [1]	FDU	—	—	—	P G	X	0.40	—	
Savoie FTS [1]	FTS	300	Cie Gén. Transatalantique	300. **600**	P G	N	0.40	—	
Savoie FVA [6]	FVA	300	Soc. Gén. des Transports Mar. à Vap.	300, **600**	P G	N	0.10	—	
Savoie FYW [1]	FYW	—	Armond Coppin	—	P G	X	0.40	—	
Scarpe	FBSC	—	Navy	300, **600**	P G	N	0.05	—	
Séduisant	FBPS	—	Navy	300, **600**	P G	N	0.05	—	
Seignelay	FBSY	—	Navy	300, **600**	P G	N	0.05	—	
Seine I	FAIS	—	Navy	300, **600**	P G	N	0.05	—	
Séminole FASO	FASO	—	Navy	300, **600**	P G	N	0.05	—	
Sénégalais	FBSL	—	Navy	300, **600**	P G	N	0.05	—	
Sénégambie [1]	FQB	—	Cie Gén. Transatlantique	—	P G	N	0.40	—	
Sentinelle	FBSN	—	Navy	300, **600**	P G	N	0.05	—	
Séphora Worms	FWW	—	Worms & Cie	—	P G	X	0.40	—	
Sèvre [1]	FAZ	300	Cie Nantaise de Nav. à Vapeur	300, **600**	P G	X	0.40	—	
Shamrock FAMS	FAMS	—	Navy	300, **600**	P G	N	0.05	—	
Shamrock FDS [1]	FDS	200	Cie des Pêcheries Maritimes de l'Atlantique	300, **600**	P G	X	0.40	—	
Shouragallus [1]	FWF	250	Soc. Mar. et Comm. du Pacifique	300, **600**	P G	X	0.40	—	
Sidi-Abdallah [6]	FVH	200	Soc. Gén. des Transports Mar. à Vap	300, **600**	P G	N	0.10	—	
Sidi-Brahim [6]	FVB	200	Soc. des Gén. Transports Mar. à Vap.	300, **600**	P G	N	0.10	—	

Name	Call		Owner					
Sidon [1]	FIO	300	Cie des Messageries Maritimes	300, 600	P G	N	0.40	—
Sierents [1]	FYJ	150	L. Dreyfus & Cie	300, 600	P G	X	0.40	—
Simon Duhamel [1]	FBD	300	Soc. les Pêcheries de Fécamp	300, 600	P G	X	0.40	—
Simoun	FASI	—	Navy	300, 600	P G	N	0.05	—
Singe [1]	UKK	180	René Petit, Dieppe	300, 600	P G	X	0.40	—
Sioux	FBSI	—	Navy	300, 600	P G	N	0.05	—
Sirocco	FBQS	—	Navy	300, 600	P G	N	0.05	—
Slack [1]	FHK	200	Vidor & Cie	300, 600	P G	X	0.40	—
Somali FBOM	FBOM	—	Navy	300, 600	P G	N	0.05	—
Somme FBSO	FBSO	—	Navy	300, 600	P G	N	0.05	—
Somme FHT [1]	FHT	—	Vidor & Cie	—	P G	X	0.40	—
Somme FQS [1]	FQS	200	Cie Gén. Transatlantique	300, 600	P G	N	0.40	—
Sonde	FABQ	—	Navy	300 600	P G	N	0.05	—
Souirah [1]	FPW	200	N. Paquet & Cie	300, 600	P G	N	0.40	—
Sous [1]	FPM	—	N. Paquet & Cie	—	P G	—	0.40	—
Spahi	FBSP	—	Navy	300, 600	P G	N	0.05	—
Sphinx [1]	FNX	—	Cie desMessageries Maritimes	—	P G	N	0.40	—
Stella FDL [18]	FDL	300	Cie de Vapeurs Français	300, 600	P G	X	0.40	—
Stilbe [1]	UGS	200	Soc. Mar. aux. de Transports	300, 600	P G	X	0.40	—
Suippe	FBUI	—	Navy	300, 600	P G	N	0.05	—
Surveillante	FBSV	—	Navy	300, 600	P G	N	0.05	—
Suzanne et Marie	FWZ	300	Worms & Cie	300, 600	P G	X	0.40	—
Sybil	FKB	—	Cie des Chargeurs f. Plisson & Cie	—	P G	X	0.40	—
Syria FJS [1]	FJS	350	Cyprien Fabre et Cie, Marseilles	300, 600	P G	X	0.40	—
S. Adresse [1]	FQP	200	Cie Gén. Transatlantique	300, 600	P G	N	0.40	—
S. Ambroise [1]	FOA	300	Soc. Nav. de l'Ouest	300, 600	P G	X	0.40	—
S. André [1]	FQW	—	Cie Gén. Transatlantique	—	P G	N	0.40	—
S. Anne [1]	FRY	—	Soc. Mar. aux. de Transports	—	P G	N	0.40	—
S. Aygulf [1]	FAB	300	Soc. Française d'Armement, Marseilles	300, 600	P G	X	0.40	—
S. Barthélémy [1]	FOY	300	Soc. Navale de l'Ouest	300, 600	P G	N	0.40	—
S. Basile [1]	FOB	300	Soc. Navale de l'Ouest	300, 600	P G	X	0.40	—
S. Camille [1]	UBD	300	Soc. Navale de l'Ouest, Paris	300, 600	P G	X	0.40	—
S. Carlo [1]	UGB	300	Soc. Maritime et Commerciale de France	300, 600	P G	X	0.40	—
S. Cyrille [1]	FOK	300	Soc. Navale de l'Ouest	300, 600	P G	X	0.40	—
S. Didier [1]	FOJ	300	Soc. Navale de l'Ouest, Paris	300, 600	P G	X	0.40	—
S. Eloi	FWE	—	Worms & Cie	—	P G	X	0.40	—
S. Firmin [1]	FOD	300	Soc. Navale de l'Ouest, Paris	300, 600	P G	X	0.40	—
S. François [1]	FOF	—	Cie Navale de l'Océanie	—	P G	X	0.40	—
S. Jean [1]	FGJ	150	Cie Gén. Transatlantique	300, 600	P G	N	0.40	—
S. Jehanne [1]	FZS	200	Soc. des Œuvres de Mer	300, 600	P G	X	0.40	4.00
S. Joseph [1]	FXJ	300	Cie Gén. Transatlantique	300, 600	P G	X	0.40	—
S. Louis FOS [1]	FOS	—	Soc. Navale de l'Ouest	—	P G	N	0.40	—
S. Louis FTF [1]	FTF	150	Cie Gén. Transatlantique	300, 600	P G	N	0.40	—
S. Marc FOC [1]	FOC	—	Soc. Navale de l'Ouest	—	P G	N	0.40	—
S. Marc FRF [1]	FRF	200	Soc. Navale de l'Ouest	300, 600	P G	X	0.40	—
S. Marco UGN [1]	UGN	350	Soc. Maritime et Commerciale de France	300, 450, 600	P G	X	0.40	—
S. Mathieu [1]	FOT	300	Soc. Navale de l'Ouest	300, 600	P G	X	0.40	—
S. Maxime [1]	FPH	300	Frisch et Cie, Marseilles	300, 600	P G	X	0.40	—
S. Michel [1]	FOM	200	Soc. Navale de l'Ouest	300, 600	P G	N	0.40	—
S. Nazaire [1]	FRZ	150	Soc. Mar. aux. de Transports	300, 600	P G	N	0.40	—
S. Paul FOL [1]	FOL	—	Soc. Navale de l'Ouest	—	P G	N	0.40	—
S. Pierre [1]	FOI	—	Soc. Navale de l'Ouest	—	P G	N	0.40	—
S. Prosper [1]	FOG	300	Soc. Navale de l'Ouest, Paris	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
FRANCE—*contd.*							Francs.	Francs.	
S. Raphaël [1][11]	FAS	150	Soc. F. d'Armement	300, **600**	P G	N	0.10	—	
S. Servan [1]	FTQ	200	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
S. Thomas FOH [1]	FOH	300	Soc. Navale de l'Ouest	300, **600**	P G	N	0.40	—	
S. Tropez [1]	FAJ	250	Soc. F. d'Armement	300, **600**	P G	N	0.40	—	
S. Vincent FOV [1]	FOV	150	Soc. Navale de l'Ouest	300, **600**	P G	N	0.40	—	
Tafna FXT [1]	FXT	150	Cie de Nav. Mixte à Vapeur	300, **600**	P G	N	0.40	—	
Tahure	FBTH	—	Navy	300, **600**	P G	N	0.05	—	
Taillebourg	FATG	—	Navy	300, **600**	P G	N	0.05	—	
Tapage	FAGT	—	Navy	300, **600**	P G	N	0.05	—	
Tapageuse	FBTA	—	Navy	300, **600**	P G	N	0.05	—	
Tavignano [1]	FXG	—	Cie de Nav. Mixte à Vapeur	—	P G	N	0.40	—	
Taza [1]	FQZ	160	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
Tchad [1]	FCQ	300	Cie des Chargeurs Réunis	300, **600**	P G	N	0.40	—	
Téméraire FBZT	FBZT	—	Navy	300, **600**	P G	N	0.05	—	
Tenax [1]	UHO	150	Soc. Maritime Nationale	300, **600**	P G	X	0.40	—	
Tensift [1]	FPU	—	N. Paquet & Cie	—	P G	N	0.40	—	
Texas FQT [1]	FQT	300	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
Thetys	FABV	—	Navy	300, **600**	P G	N	0.05	—	
Thuya	FATU	—	Navy	300, **600**	P G	N	0.05	—	
Tibet [1]	FNH	200	Fraissinet et Cie	300, **600**	P G	X	0.40	—	
Timgad [1][7]	FGO	250	Cie Gén. Transatlantique	300, **600**	P G	N	0.10	—	
Tintamarre	FBPT	—	Navy	300, **600**	P G	N	0.05	—	
Tirailleur	FBTI	—	Navy	300, **600**	P G	N	0.05	—	
Titan FQI [1]	FQI	—	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
Titan FIA [12]	FIA	300	Soc. les Affréteurs Réunis	300, **600**	P G	N	0.40	—	
Tonkinois	FBKN	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 243	FAHY	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 250	FBCL	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 263	FBDR	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 266	FANS	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 269	FBNL	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 274	FBEK	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 278	FASZ	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 288	FBQG	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 296	FAVY	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 297	FBDY	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 299	FATD	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 302	FBHW	—	Navy	300, **600**	P G	N	0.05	—	
Torpilleur 305	FBAY	—	Navy	300, **600**	P G	N	0.05	—	

Torpilleur 306 ..	.. FACG	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 307 ..	.. FBGZ	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 308 ..	.. FBKX	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 310 ..	.. FBYP	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 312 ..	.. FAYL	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 314 ..	.. FBMW	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 315 ..	.. FBOY	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 316 ..	.. FBQZ	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 318 ..	.. FBSW	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 321 ..	.. FBUZ	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 322 ..	.. FBZV	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 324 ..	.. FBYT	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 326 ..	.. FBRZ	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 327 ..	.. FBOK	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 329 ..	.. FAPY	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 330 ..	.. FAWR	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 332 ..	.. FAMH	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 334 ..	.. FBZK	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 336 ..	.. FAZD	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 337 ..	.. FBNS	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 338 ..	.. FBWU	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 339 ..	.. FBXU	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 340 ..	.. FBXW	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 341 ..	.. FBYX	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 342 ..	.. FABW	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 349 ..	.. FBYG	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 350 ..	.. FAUZ	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 351 ..	.. FBEZ	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 352 ..	.. FBHY	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 357 ..	.. FBMY	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 359 ..	.. FARZ	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 360 ..	.. FAWS	—	Navy	300, 600	P G ..	N	00.5	—
Torpilleur 361 ..	.. FAVK	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 362 ..	.. FAZG	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 363 ..	.. FBPZ	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 365 ..	.. FBNX	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 366 ..	.. FAVW	—	Navy	300, 600	P G ..	N	0.05	—
Torpilleur 369 ..	.. FBQX	—	Navy	300, 600	P G ..	N	0.05	—
Touareg	.. FBTG	—	Navy	300, 600	P G ..	N	0.05	—
Toul	.. FBTL	—	Navy	300, 600	P G ..	N	0.05	—
Toulouse[1] ..	.. FRQ	200	Soc. Mar. aux. de Transports ..	300, 600	P G ..	N	0.40	—
Touraine[1] ..	.. FTT	300	Cie Gén. Transatlantique ..	300, 600	P G ..	N	0.40	—
Tours FZV[1] ..	.. FZV	—	State Railways Administration..	—	P G ..	X	0.15	3.50
Tours FRI[1] ..	.. FRI	200	Soc. Mar. aux. de Transports ..	300, 600	P G ..	X	0.40	—
Tourteau.. ..	.. FATO	—	Navy	300, 600	P G ..	N	0.05	—
Tourterelle ..	.. FAQT	—	Navy	300, 600	P G ..	N	0.05	—
Tourville ..	.. FALT	—	Navy	300, 600	P G ..	N	0.05	—
Tramontane ..	.. FBTN	—	Navy	300, 600	P G ..	N	0.05	—
Travailleur ..	.. FAMT	—	Navy	300, 600	P G ..	N	0.05	—
Trident FBVT ..	.. FBVT	—	Navy	300, 600	P G ..	N	0.05	—
Trombe	.. FATB	—	Navy	300, 600	P G ..	N	0.05	—
Tumulte ..	.. FBTU	—	Navy	300, 600	P G ..	N	0.05	—
Turenne[1] ..	.. FPN	—	N. Paquet & Cie	—	P G ..	N	0.40	—
Typhon FATY ..	.. FATY	—	Navy	300, 600	P G ..	N	0.05	—
Typhon UHP[1] ..	.. UHP	150	Soc. Maritime Nationale, Paris ..	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
FRANCE—*contd.*							Francs.	Francs.	
Tzar Nicolas II	FATZ	—	Navy	300, **600**	P G	N	0.05	—	
Uranus [1]	FBU	250	Louis Dero, Le Havre	300, **600**	P G	X	0.40	—	
Ustaritz [1]	FZQ	200	Quitard & Cie, Rouen	300, **600**	P G	X	0.40	—	
Utile	FAUI	—	Navy	300, **600**	P G	N	0.05	—	
Utique [2]	FWU	—	Delmas Frères	—	P G	X	0.40	—	
Vacarme	FBNV	—	Navy	300, **600**	P G	N	0.05	—	
Vague	FAVG	—	Navy	300, **600**	P G	N	0.05	—	
Vaillante	FBVA	—	Navy	300, **600**	P G	N	0.05	—	
Valdivia [1]	FVJ	300	Soc. Gén. des Transports Mar. à Vap.	300, **600**	P G	N	0.40	—	
Vanneau II	FABD	—	Navy	300, **600**	P G	N	0.05	—	
Vaucluse FAVC	FAVC	—	Navy	300, **600**	P G	N	0.05	—	
Vaucluse FQV [1]	FQV	200	Cie Gén. Transatlantique	300, **600**	P G	N	0.40	—	
Vauquois	FBVQ	—	Navy	300, **600**	P G	N	0.05	—	
Vautour	FBIV	—	Navy	300, **600**	P G	N	0.05	—	
Véga FYV [1]	FYV	—	Joseph Huret	—	P G	X	0.40	—	
Vence [1]	FKK	200	Soc. Maritime Nationale	300, **600**	P G	X	0.40	—	
Vendée [1]	FGW	—	Cie Gén. Transatlantique	—	P G	N	0.40	—	
Vendome [1]	UMC	200	Soc. Maritime aux. de Transports	300, **600**	P G	X	0.40	—	
Verdun	FBVD	—	Navy	300, **600**	P G	N	0.05	—	
Vergniaud	FAQV	—	Navy	300, **600**	P G	N	0.05	—	
Vérité	FANV	—	Navy	300, **600**	P G	N	0.05	—	
Victoire	FBVI	—	Navy	300, **600**	P G	N	0.05	—	
Victoire III	FABM	—	Navy	300, **600**	P G	N	0.05	—	
Victor Hugo	FAVH	—	Navy	300, **600**	P G	N	0.05	—	
Vigoureux	FAVX	—	Navy	300, **600**	P G	N	0.05	—	
Vigoureux II	FABX	—	Navy	300, **600**	P G	N	0.05	—	
Ville d'Arras [1]	FLR	—	Cie Havraise Péninsulaire de Nav. à Vap.	—	P G	N	0.40	—	
Ville de Bône [1, 9]	FGB	150	Cie Gén. Transatlantique	300, **600**	P G	N	0.10	—	
Ville de Cette	FYF	—	Cie des Bateaux à Vap. du Nord	—	P G	X	0.40	—	
Ville de Havre [1]	FLA	200	Cie Havraise Péninsulaire de Nav. à Vap.	300, **600**	P G	X	0.40	—	
Ville de Madrid [1, 10]	FGM	150	Cie Gén. Transatlantique	300, **600**	P G	N	0.10	—	
Ville de Majunga [1]	FLI	200	Cie Havraise Péninsulaire de Nav. à Vap.	300, **600**	P G	N	0.40	—	
Ville de Marseille [1]	FLS	150	Cie Havraise Péninsulaire de Nav. à Vap.	300, **600**	P G	X	0.40	—	

Ville de Metz [1] ..	.. FLB	300	Compagnie Havraise Péninsulaire de Nav. à Vapeur	300, 600	P G	..	X	0.40	—
Ville de Nantes [1,2]	.. FGL	—	Cie Gén. Transatlantique.. ..	—	P G	..	N	0.10	—
Ville de Paris ..	.. FLP	250	Cie Havraise Péninsulaire de Nav. à Vap.	300, 600	P G	..	X	0.40	—
Ville de Reims [1]..	.. FLM	—	Cie Havraise Péninsulaire de Nav. à Vap.	—	P G	..	N	0.40	—
Ville de Rouen [1]..	.. FLL	200	Cie Havraise Péninsulaire de Nav. à Vap.	300, 600	P G	..	X	0.40	—
Ville de Tamatave [1]	.. FLQ	150	Cie Havraise Péninsulaire de Nav. à Vap.	300, 600	P G	..	N	0.40	—
Ville de Tunis [1,2]	.. FGT	250	Cie Gén. Transatlantique.. ..	300, 600	P G	..	N	0.10	—
Ville d'Oran FGZ [1,2]	.. FGZ	200	Cie Gen. Transatlantique.. ..	300, 600	P G	..	N	0.10	—
Ville d'Oran FLO [1]	.. FLO	200	Cie Havraise Péninsulaire de Nav. à Vap.	300, 600	P G	..	X	0.40	—
Ville d'Ys ..	.. FBVY	—	Navy	300, 600	P G	..	N	0.05	—
Villeneuve [1] ..	.. FKJ	200	Soc. Maritime Nationale ..	300, 600	P G	..	X	0.40	—
Vinh-Long ..	.. FAVL	—	Navy	300, 600	P G	..	N	0.05	—
Virginie [1].. ..	.. FTV	250	Cie Gén. Transatlantique.. ..	300, 600	P G	..	N	0.40	—
Vitry-le-François	.. FBVL	—	Navy	300, 600	P G	..	N	0.05	—
Volta	.. FATV	—	Navy	300, 600	P G	..	N	0.05	—
Voltaire	.. FAIV	—	Navy	300, 600	P G	..	N	0.05	—
Volubilis [1] ..	.. FXX	200	Cie Gén. Transatlantique ..	300, 450, 600	P G	..	X	0.40	—
Vulcain [1].. ..	.. FRV	150	Soc. les Affréteurs Réunis ..	300, 600	P G	..	X	0.40	—
Wagram [1] ..	.. UKC	200	Altazin, Darquer & Cie	300, 600	P G	..	X	0.40	—
Waldeck-Rousseau	.. FARW	—	Navy	300, 600	P G	..	N	0.05	—
Wimereux [1] ..	.. FHW	200	Vidor & Cie	300, 600	P G	..	X	0.40	—
Yser FAY [1] ..	.. FAY	—	Soc. Gén. d'Armement	—	P G	..	N	0.40	—
Yser FBYR ..	.. FBYR	—	Navy	300, 600	P G	..	N	0.05	—
Yucca FBYU ..	.. FBYU	—	Navy	300, 600	P G	..	N	0.05	—
Zébu	.. FAZU	—	Navy	300, 600	P G	..	N	0.05	—
GERMANY									
Aamot [2].. ..	.. DAA	200	Seetransportstelle der Reichsmarine, Stettin	—	—	—	—	—	—
Abessinia [3] ..	.. DAB	200	Hamburg-Amerika Line	300, 600	P G	..	X	0.40	4.00
Achilles DAC [1] ..	.. DAC	200	Reichsabrechnungsstelle ..	300 600	P G	..	X	0.40	4.00
Adalia [3]	.. DEX	200	Deutsche Levante Line	300, 600	P G	..	X	0.40	4.00
Adana [3]	.. DXD	200	Deutsche Levante Line	300, 600	P G	..	X	0.40	4.00
Adler [4]	.. DAR	100	Argo S.S. Co.	300, 600	P G	..	X	0.40	4.00
Albatros DAS [3]	.. DAS	200	Nordischer Bergungs-Verein, Hamburg	300, 600	P G	..	X	0.40	4.00
Aleppo DAP [3]	.. DAP	200	Deutsche Levante Line	300, 600	P G	..	X	0.40	4.00
Alexandria [3] ..	.. DAE	200	Hamburg-Amerika Line	300, 600	P G	..	X	0.40	4.00
Altmark [1] ..	.. DYN	200	Hamburg-Amerika Line	300, 600	P G	..	X	0.40	4.00
Amassia [3] ..	.. DBW	200	Deutsche Levante Line	300, 600	P G	..	X	0.40	4.00
Arbeit [1]	.. DAT	200	Reichsabrechnungsstelle	300, 600	P G	..	X	0.40	4.00
Arfeld [3] ..	.. DAO	200	Continentale Reederei A.-G. ..	300, 600	P G	..	X	0.40	4.00
Argentina DAN [3]	.. DAN	200	Hamburg-Sudamerikanische D/G	300, 600	P G	..	N	0.40	4.00
Annie-Hugo Stinnes VI [3]	DAI	200	Hugo Stinnes, Mülheim ..	300, 600	P G	..	X	0.40	4.00
Atle Jarl [2] ..	.. DJT	200	Woermann Line A.G. und Deutsche Ost-Afrika Line	300, 600	P R	..	X	0.40	4.00

[1] Operated by the Deutsche Betriebsgesellschaft für drahtlose Telegraphie, Berlin

[2] Operated by the owner

[3] Operated by the owner; the accounts are settled by the Deutsche Betriebsgesellschaft für drahtlose Telegraphie, Berlin

[4] Operated by the Deutscher Seefischerei-Verein, Berlin

[5] The ship is at the present time in the service of Hans Hinrich Schmidt (Reedereiverband), Hamburg

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.
GERMANY—*contd.*							Francs.	Francs.
Bagdad DVB [3]	DVB	200	Deutsche Levant Line	300, **600**	P G	X	0.40	4.00
Barenfels [3]	DBN	200	Deutsche Dampfschiffahrts Gesellschaft Hansa	300, **600**	P G	X	0.40	4.00
Berta [3]	DBE	200	Reederei K. M. Faber & Co.	300, **600**	P G	X	0.40	4.00
Bremerhaven [3]	DBV	200	Norddeutscher-Lloyd	300, **600**	P G	X	0.40	4.00
Brillant [3]	DBA	200	Dienststelle der Admiralitat	300, **600**	P G	0900 to 1200 1500 to 1800 2200 to 2400	0.40	4.00
Bubendey [1]	DEY	200	Hamburg-Amerika Line	300, **600**	P G	N	0.12	—
Cairo DCA [6]	DCA	200	Deutsche Levante Line	300, **600**	P G	X	0.40	4.00
Carbo II [3]	DCO	200	Dienststelle der Admiralitat	300, **600**	P G	0900 to 1200 1500 to 1800 2200 to 2400	0.40	4.00
Cette [3]	DXN	200	R. M. Sloman, Jr.	300, **600**	P G	X	0.40	4.00
Ceuta [3]	DCX	200	Oldenburg - Portgiesische S.S. Co.	300, **600**	P G	X	0.40	4.00
Condor DOJ [3]	DOJ	200	R. M. Sloman, Jr.	300, **600**	P G	X	0.40	4.00
Cronshagen [3]	DCN	200	Hamburg Süd-Amerik, S.S. Co.	300, **600**	P G	0900 to 1200	0.40	4.00
Deutschfeld [3]	DBG	200	Continentale Rhederei A.-G	—	—	—	—	—
Deutschland [2, 14]	DDU	110	Prussian Rly. Administration	300, **375**, 600	P R [13]	X	0.30	3.00
Ditmar Koel [3]	DKV	28	Hamburgische Marineverwalting	300	O	X	—	—
Edmund H. Stinnes 4 [1]	DET	200	Aktien-Gesellschaft Hugo Stinnes für Seeschiffahrt und Ubersee-handel	300, **600**	P G	X	0.40	4.00
Eisbrecher Berlin [3]	DJY	75	Die vorsteher der Kaufmannschaft	300, **600**	—[12]	X	0.40	4.00
Eisbrecher Pommern [3]	DJZ	75	Die vorsteher der Kaufmannschaft	300, **600**	—[12]	X	0.40	4.00
Ella [3]	DEL	200	Reederei Rochling, Menzell & Co.	300, **600**	P G	X	0.40	4.00
Erato [3]	DER	200	Capt. Gadebergs	300, **600**	P G	X	0.40	4.00
Este [3]	DXW	120	Syndica Rhederei	300, **600**	P G	X	0.40	4.00
Fehmarn [3]	DFE	200	Leederei Rochling, Menzell & Co.	300, **600**	P G	X	0.40	4.00
Frauenfels [3]	DBK	200	Deutsche D.-G Hansa, Bremen	300, **600**	P G	X	0.40	4.00
Friedrich Franz IV [3]	DFU	200	Mecklenburg Rly.	300, 400, **600**	P G	—	—	—
Friesland DFI [3]	DFI	50	Wasserbauamt, Emden	300	O	X	0.40[16]	4.00[16]
Fritz Stauss [3]	DZX	200	Deutsche Petroleum A.-G.	300, **600**	P G	X	0.40	4.00
Gonzenheim [3]	DAQ	200	Schleppschiffahrtsgesellschaft Unterweser	300, **600**	P G	X	0.40	4.00
Gotenhof [3]	DGP	200	Neue Dampfer-Compagnie	300, **600**	P G	X	0.40	4.00

Remarks.

[6] The ship is at the present time in the service of Lilienfeld u. Zacher, Hamburg

[7] The ship is at the present time in the service of the Woermann Line, Hamburg

[8] The ship is at the present time in the service of the Woermann Line and of the Deutsche Ostafrika Line, Hamburg

[9] School ship belonging to the Deutscher Schulschiffverein, Bremen

[10] Steamer belonging to the Government at Köslin

[11] Exploration steamer belonging to Germany

[12] Particular correspondence, relating to the service of the ship

[13] Public correspondence with Sassnitz and Trälleborg, and also with the other ferry-boats of the Sassnitz - Trälleborg line. Official correspondence with Sassnitz and Trälleborg, and also with the other ferry-boats of the Sassnitz - Trälleborg line, concerning the railway traffic

[14] The service of the Sassnitz - Trälleborg line being performed alternately by German and

Gretchen Müller [8]	DFP	125	Otto A. Müller	300, 600	P G	X	0.40	4.00	
Grille [8]	DGI	200	Norddeutscher Lloyd	300, 600	P G	—	0.40	4.00	
Grimm [1]	DGM	800	Hamburg-Amerika Line	300, 600	P G	X	0.40	4.00	
Groden [8]	DGN	50-60	Cuxhavener Lotsenschaft e. V.	300, 600	P G	X	0.40	4.00	
Grossherzogin Elisabeth [8]	DGE	200	Deutscher Schulschiff-Verein	300, 600	P G	X	0.40	4.00	
Grüssgott [8]	DGR	200	Norddeutscher Lloyd	300, 600	P G	X	0.40	4.00	
Habsburg [8]	DHY	200	Dienststelle der Admiralität, Hamburg	—	—	—	—	—	
Hamburg DHM [8]	DHM	200	Deutsch-Australische S.S. Co.	300, 600	P G	X	0.40	4.00	
Hannover DHV [8]	DHV	200	Deutsch-Australische D.-G	300, 600	P G	X	0.40	4.00	
Hans [8]	DHS	200	Reederei Rochling, Menzell & Co.	300, 600	P G	X	0.40	4.00	
Harald DHD [8]	DHD	200	Dienststelle der Admiralität	300, 600	P G	0900 to 1200 1500 to 1800 2200 to 2400	0.40	4.00	
Harburg [8]	DHU	200	Deutsch-Australische S.S. Co.	300, 600	P G	X	0.40	4.00	
Hela [8]	DHL	200	Neue Dampfer-Compagnie	300, 600	P G	1100 to 1300 2000 to 2200	0.40	4.00	
Helene Blumenfeld [8]	DHB	200	Bd. Blumenfeld	300, 600	P G	X	0.40	4.00	
Henry Lutgens [8]	DXK	200	Bugsier-Reederei- und Bergungs-A.G.	300, 600	P G	X	0.40	4.00	
Hercules DXR [8]	DXR	200	Bugsier-Reederei- und Bergungs-Aktiengesellschaft	300, 600	P G	X	0.40	4.00	
Herkules [8]	DHB	200	Bugsier-Reederei- und Bergungs-A.-G.	300, 600	P G	X	0.40	4.00	
Hertha [8]	DHQ	200	Stettiner Dampfschiffs-Gesellschaft J. F. Braeunlich	300, 600	P G	N	0.40	4.00	
Herzogin Cäcilie [8]	DHZ	200	Norddeutscher Lloyd	300, 600	P G	X	0.40	4.00	
Hindenburg [1]	DHI	200	A.-G. Hugo Stinnes für Seeschiffahrt und Uberseehandel	300, 600	P G	X	0.40	4.00	
Horncap [8]	DXF	200	Dampfschiffahrtsreederei Horn A.G.	300, 600	P G	X	0.40	4.00	
Kaiser DKQ [1]	DKQ	200	Hamburg-Amerika Line	300, 600	P G	N	0.12	—	
Kiew [8]	DKW	50-60	Woermann Line and Deutsche Ostafrika Line	300, 600	P G	N	0.40	4.00	
Kypros [8]	DVP	200	Dienststelle der Admiralität	300, 600	P G	0900 to 1200 1500 to 1800 2200 to 2400	0.40	4.00	
Lauterfels [8]	DBQ	200	Deutsche Dampschiffahrts-Gesellschaft Hansa	300, 600	P G	X	0.40	4.00	
Lili Woermann [1]	DWX	200	Woermann Line	300, 600	P G	X	0.40	4.00	
Lisboa DLA [8]	DLA	200	Oldenburg-Portugiesische S.S. Co.	300, 600	P G	X	0,40	4.00	
Ludendorff [1]	DLD	200	Aktiengesellschaft Hugo Stinnes	300, 600	P G	X	0.40	4.00	
Marie Horn [8]	DFK	200	Carl Aug. John G.m.b.H.	300, 600	P G	X	0.40	4.00	
Martha Woermann [1]	DWW	200	Woermann Line	300, 600	P G	X	0.40	4.00	
Mecklenburg DFV [8]	DFV	200	Mecklenburg Rly.	300, 400, 600	P G	—	—	—	
Möwe [4]	DMW	100	Argo S.S. Co.	300, 600	P G	X	0.40	4.00	
Murla [8]	DMU	200	Roland Line	300, 600	P G	X	0.40	4.00	
Najade [8]	DNJ	60	Norddeutscher Lloyd	300, 600	P G	X	0.12	—	
Niederwald [8]	DND	200	Hamburg-Amerika Line	300, 600	P G	X	0.40	4.00	
Nixe [8]	DNX	60	Norddeutscher Lloyd	300, 600	P G	X	0.12	—	
Nymphe [8]	DNY	200	Norddeutscher Lloyd	300, 600	P G	0800 to 1000 1200 to 1400 1600 to 1800	0.40	4.00	
Oberbürgermeister Haken [8]	DOC	200	Neue Dampfer Kompagnie, Stettin	300, 600	P G	0800 to 1200 1600 to 2000	0.40	4.00	

Swedish ferry-boats, it is necessary to replace the name of the ship station in the address of radiotelegrams by one of the following indications:—

Ferry-boat A for the boat leaving Sassnitz in the morning;

Ferry-boat C for the boat leaving Sassnitz in the afternoon;

Ferry-boat B for the boat leaving Trälleborg in the morning;

Ferry-boat D for the boat leaving Trälleborg in the afternoon

[15] The ship charge for radiotelegrams intended for the ferry-boats is, without regard to the nationality of the boats, 18 centimes per word, minimum 1 fr. 80 centimes, when the radiotelegrams are transmitted via Sassnitz, and 30 centimes per word, minimum 3 fr., when they are transmitted via Trälleborg

[16] For radiotelegrams liable to charge

[17] Operated by the Dienststelle der Admiralität, Geestemünde

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
GERMANY—*contd.*									
Odin DON [8]	DON	200	Reederei Arnold Bernstein	300, **600**	P G	X	0.40	4.00	
Odin DOQ [8]	DOQ	200	Stettiner D.-G. J. F. Braeunlich, G.m.b.H.	300, **600**	P G	N	0.40	4.00	
Orla DOA [8]	DOA	120	Rhederei A.-G. von 1896	300, **600**	P G	X	0.40	4.00	
Orlando [8]	DOD	120	Rhederei A.-G. von 1896	300, **600**	P G	X	0.40	4.00	
Ostsee [8]	DOE	200	Government	300, **600**	P G	X	0.40	4.00	
Pommern [8]	DPO	200	Neue Dampfer Kompagnie, Stettin	300, **600**	P G	X	0.40	4.00	
Pontus [8]	DXQ	200	Bugsier-, Reederei- und Bergungs-A.-G.	300, **600**	P G	X	0.40	4.00	
Poseidon [4 11]	DPY	325	—	300, **600**	P G	0800 to 0830 1315 to 1330 2000 to 2030	0.40	4.00	
Preussen DPC [8]	DPC	110	Prussian Rly. Administration	300, **375**, 600	P R [18]	X	0.30	3.00	
Prinz Eitel Friedrich [8]	DPI	200	Neue Dampfer Co.	300, **600**	P G	X	0.25	2.50	
Prinzessin Heinrich [1]	DPD	60	Hamburg-Amerika Line	300, **600**	P G	1000 to 1200 2400 to 0200	0.12	—	
PrinzessinS ophie Charlotte [8]	DPP	200	Neue Dampfer Co.	300, **600**	P G	X	0.25	2.50	
Ralum [8]	DLM	70	Hamburg. Südsee A.-G.	300, **600**	P G	X	0.40	4.00	
Rotherstieg [8]	DRG	200	Reederei Dr. Max. Albrecht, Hamburg	300, **600**	P G	X	0.40	4.00	
Roland [8]	DRB	75	Bugsier-Reederei- und Bergungs-A.-G.	300, **600**	P G	X	0.40	4.00	
Sachsenwald [8]	DSW	200	Hamburg-Amerika Line	300, **600**	P G	X	0.40	4.00	
Salvator DSA [8]	DSA	200	Nordischer Bergungs-Verein	300, **600**	P G	X	0.40	4.00	
Schelde [1]	DSC	200	Reichsabrechnungsstelle	300, **600**	P G	X	0.40	4.00	
Schwan [6]	DSN	100	Argo S.S. Co.	300, **600**	P G	X	0.40	4.00	
Seeadler DSD [8]	DSD	200	Reederei W. Schuchmann	300, **600**	P G	X	0.40	4.00	
Seeadler DSE [8]	DSE	60	Norddeutscher Lloyd	300, **600**	P G	X	0.40	4.00	
Seehund [8]	DSH	200	W. Schuchmann	300, **600**	P G	X	0.40	4.00	
Seelowe [8]	DAF	200	Reederei W. Schuchmann, Geestemunde	300, **600**	P G	X	0.40	4.00	
Seestern [8]	DSS	200	Cuxhaven-Brunsbuttel Dampfer A.-G.	300, **600**	P G	X	0.40	4.00	
Soneck [8]	DSO	200	Deutsch S.S. Co., Hansa	300, **600**	P G	X	0.40	4.00	
Sonnenberg [6]	DDD	200	Hermann Kimme	300, **600**	P G	X	0.40	4.00	
Sophie Rickmers [8]	DSR	200	Rickmers-Reederei A.G., Hamburg	300, **600**	P G	X	0.40	4.00	
Strassburg [8]	DSB	200	Neue Dampfer-Compagnie	300, **600**	P G	1100 to 1300 2000 to 2200	0.40	4.00	

Ship	Call	Power	Owner	Wave-lengths	Service		Hours	Rate	Rate
Sturmfels [a]	[illegible]	200	[illegible] Dampfschiffahrts-Gesellschaft Hansa	300, 600	[illegible]		[illegible]	[illegible]	[illegible]
Tamara II [a]	DXS	200	Reederei W. Schuchmann	300, 600	P G	..	X	0.40	4.00
Tarsis [a]	DGS	200	Roland Line, Bremen	300, 600	P G	..	X	0.40	4.00
Titan DDG [a]	DDG	200	Bugsier-, Reederei-, und Bergungs-A.-G.	300, 600	P G	..	X	0.40	4.00
Urundi [a]	DUJ	200	Deutsche Ost-Afrika Line, Hamburg	300, 600	P G	..	X	0.40	4.00
Usaramo [a]	DUO	200	Deutsche Ost-Afrika Line ..	300, 600	P G	..	N	0.40	4.00
Villareal DVL [a] ..	DVL	200	Oldenburg-Portugiesische S.S. Co.	300, 600	P G	..	X	0.40	4.00
Vorwarts [a]	DVS	200	Norddeutscher Lloyd	300, 600	P G	..	X	0.40	4.00
Wajat [a]	DWJ	60	Woermann Line A.-G. und Deutsche Ost-Afrika Line	300, 600	P G	..	X	0.40	4.00
Wangerooge [a]	DQA	120	Vereinigte Deutsche Nordseelotsen e.G.m.b.H.	300, 600	P G	..	X	0.40	4.00
Wartburg	DWB	200	Neue Dampfer-Compagnie ..	300, 600	P G	..	1100 to 1300 2000 to 2200	0.40	4.00
Wilhelm [a]	DWI	200	Reederei W. Schuchmann ..	300, 600	P G	..	X	0.40	4.00
Winfried DWP [a] ..	DWP	250	Hamburg-Bremer-Afrika Line ..	300, 600	P G	..	1000 to 1200 1500 to 1800	0.40	4.00
Zeus [a]	DZE	200	Bugsier-, Reederei- und Bergungs-A.-G.	300, 600	P G	..	X	0.40	4.00
GIBRALTAR									
Gibel Sarsar [1]	VRM	200	M. H. Bland & Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Rescue VRN [a]	VRN	100	M. H. Bland & Co., Ltd... ..	300, 600	P G	..	X	0.40	—
GREAT BRITAIN (See **UNITED KINGDOM**)									
GREECE									
Achilles SWZS [a] ..	SWZS	150-200	D. Anghelatos, Piraeus	300, 600	P G	..	X	0.40	4.00
Adamantios Lemos [a] ..	SWX	100-150	Lemos M. Piraeus	300, 600	P G	..	X	0.40	4.00
Adriaticos [a]	SVA	100-150	Hellenic Co. of Mar. Enterprises	300, 600	P G	..	N	0.40	4.00
Aeon [a]	SWA	100-150	Nav. à Vapeur Panhellénique ..	300, 600	P G	..	N	0.40	4.00
Aetos	SYO	—	Navy	—	O	..	—	—	—
Agapi [a]	TGI	100-150	Hadjikyriakos Brothers	300, 600	P G	..	X	0.40	4.00
Aigli	SYV	—	Navy	—	O	..	—	—	—
Alcyon	SYU	—	Navy	—	O	..	—	—	—
Alexandros Kaloutas [a]	THL	100-150	Alexandros Kaloutas	300, 600	P G	..	X	0.40	4.00
Amfitrite	SYM	—	Navy	—	O	..	—	—	—
Andreas [a]	SVS	100-150	Embiricos Bros.	300, 600	P G	..	X	0.40	4.00
Andros [a]	SVC	200	Cie Nationale Hellenique de Navigation	300, 600	P G	..	N	0.40	4.00
Antigoni [a]	SVJ	—	Hellenic Co. of Mar. Enterprises ..	300, 600	P G	..	N	0.40	4.00
Antonios	SVX	50-80	N. Galanos	300, 600	P G	..	X	0.40	4.00
Arcadia TGV [a] ..	TGV	100-150	P. Pantaleon Fils	300, 600	P G	..	X	0.40	4.00
Archangelos [a]	SVR	150-200	G. Livanos	300, 600	P G	..	X	0.40	4.00
Arethousa	SYW	—	Navy	—	O	..	—	—	—
Argo [a]	THE	100-150	The Chios S.S. Co., Ltd...	300, 600	P G	..	X	0.40	4.00
Argolis [a]	SWG	100-150	Hellenic Co. of Mar. Enterprises	300, 600	P G	..	N	0.40	4.00
Argostoli [a]	THT	150-200	N. E. Ambatiolos	300, 600	P G	..	X	0.40	4.00
Aris [a]	TGQ	100-150	G. Vergottis	300, 600	P G	..	X	0.40	4.00
Aristides [a]	THO	100-150	C. Athanasoulas, Piraeus ..	300, 600	P G	..	X	0.40	4.00
Aristides Bistis [a] ..	SWI	150-200	A. Bistis	300, 600	P G	..	X	0.40	4.00

Gibraltar: [1] Operated by the Marconi International Marine Communication Co., Ltd., London
[a] Operated by the owners

Greece: [1] Operated by the owner of the vessel; controlled by the Soc. Anonyme Internationale de Tel. sans Fils
[a] Operated by the Soc. Anon. Internationale de Tel. sans Fils

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
GREECE—*contd.*							Francs.	Francs.	
Aspis	SYI	—	Navy	—	O	—	—	—	
Assimina Embiricos [2]	THU	150-200	S. G. Embiricos	300, **600**	P G	X	0.40	4.00	
Athanasios [2]	SWPS	100-150	N. D. Lyciardopoulos, Piraeus	300, **600**	P G	X	0.40	4.00	
Athina [2]	SVM	100-150	Hellenic Co. of Mar. Enterprises	300, **600**	P G	N	0.40	4.00	
Atromitos [2]	TGT	100-150	Yannoulatos Brothers	300, **600**	P G	X	0.40	4.00	
Averoff	SYA	—	Navy	—	O	—	—	—	
Byzantion [2]	TGX	100-150	P. Pantaleon Fils	300, **600**	P G	X	0.40	4.00	
Cephalonia THY [2]	THY	150-200	G. E. Ambatielos, London	300, **600**	P G	X	0.40	4.00	
Cephalonia [2]	TGS	100-150	Yannoulatos Bros.	300, **600**	P G	X	0.40	4.00	
Chalkis [2]	THD	100-150	Paneuboic S.S. Co.	300, **600**	P G	X	0.40	4.00	
Chios [2]	SVB	100-150	Hellenic Co. of Mar. Enterprises	300, **600**	P G	N	0.40	4.00	
Criti [2]	THG	100-150	Hellenic Co. of Mar. Enterprises	300, **600**	P G	X	0.40	4.00	
Daphne SWQS [2]	SWQS	100-150	N. D. Lyciardopoulos, Piraeus	300, **600**	P G	X	0.40	4.00	
Daphne TGA [2]	TGA	150-200	Hellenic Co. of Mar. Enterprises	300, **600**	P G	X	0.40	4.00	
Daphni	SYX	—	Navy	—	O	—	—	—	
Delphin [2]	TGR	100-150	G. Vlassopulo Frères et S. Cottakis	300, **600**	P G	X	0.40	4.00	
Demetrios Pandelis [2]	SWTS	150-200	Pandeli Bros., Piraeus	300, **600**	P G	X	0.40	4.00	
Dionyssios Stathatos [2]	SWC	150-200	Dionyssios Stathatos	300, **600**	P G	X	0.40	4.00	
Dirphys [2]	SVZ	100-150	Panhellénique S. N. Co.	300, **600**	P G	N	0.40	4.00	
Doris SYY	SYY	—	Navy	—	O	—	—	—	
Doxa	SYD	—	Navy	—	O	—	—	—	
Efstathios [2]	SWD	150-200	—	300, **600**	P G	X	0.40	4.00	
Eftichia Vergotti [2]	TGH	100-150	G. Vergottis	300, **600**	P G	X	0.40	4.00	
Elena Margarita [2]	TGZ	100-150	Oriental Shipping Co., Ltd.	300, **600**	P G	X	0.40	4.00	
Eleni Stathatos [2]	SWVS	150-200	D. A. Stathatos, Athens	300, **600**	P G	X	0.40	4.00	
Ellin [2]	SWO	150-200	S. G. Embiricos	300, **600**	P G	X	0.40	4.00	
Elpidophoros [2]	SWH	100-150	E. Ladopoulo Sons	300, **600**	P G	N	0.40	4.00	
Elpis [2]	SVL	100-150	Hellenic Co. of Mar. Enterprises	300, **600**	P G	X	0.40	4.00	
Elsie [2]	TGE	150-200	Hellenic Co. of Mar. Enterprises	300, **600**	P G	X	0.40	4.00	
Emmanuel [2]	THA	100-150	Oriental Shipping Co., Ltd.	300, **600**	P G	X	0.40	4.00	
Eperoki [2]	SWU	100-150	G. Yanoulatos Bros.	300, **600**	P G	X	0.40	4.00	
Erissos [2]	SVE	100-150	Gregory J. Theophilatos	300, **600**	P G	X	0.40	4.00	
Ermoupolis [2]	SVO	100-150	Hellenic Co. of Mar. Enterprises	300, **600**	P G	N	0.40	4.00	
Eugenia [2]	SWYS	80	Shipping Traders, Ltd., London	300, **600**	P G	X	0.40	4.00	
Eugenie S. Embiricos [2]	SWUS	150-200	S. G. Embiricos, Athens	300, **600**	P G	X	0.40	4.00	
Evangelos [2]	SWK	150-200	N. Ambatielcs & Co.	300, **600**	P G	X	0.40	4.00	
Evros [2]	SWSS	150-200	The Nat. S.N. Co., Ltd., of Greece	300, **600**	P G	X	0.40	4.00	
Fotis [2]	TGY	100-150	N. Lykiardopoulos	300, **600**	P G	X	0.40	4.00	
Gholssa [1]	SVG	150	Comp. Nat. Hellenique de Nav.	300, **600**	P G	N	0.40	4.00	

Granicos [2]	SWS	150-200	Embiricos Bros.	300, 600	P G	X	0.40	4.00
Helli	SZA	—	Navy	—	O	—	—	—
Hilarius	SWL	—	—	—	—	—	—	—
Hydra SYH	SYH	—	Navy	—	O	—	—	—
Hydra SVH [2]	SVH	100-150	Hellenic Co. of Mar. Enterprises	300, 600	P G	N	0.40	4.00
Ierax	SYE	—	Navy	—	O	—	—	—
Ioanna THS [2]	THS	150-200	E. Angelis	300, 600	P G	X	0.40	4.00
Ioannis [2]	TGO	100-150	National S.N. Co., Ltd., of Greece	300, 600	P G	X	0.40	4.00
Ioannis Vatis [2]	SWR	100-150	J. L. Vatis & Co.	300, 600	P G	X	0.40	4.00
Iocasti [2]	THX	150-200	Hellenic Transport S.S. Co.	300, 600	P G	X	0.40	4.00
Iolkos [2]	SWJ	100-150	Hellenic Transport Co.	300, 600	P G	X	0.40	4.00
Irene	SVY	50-80	N. Galanos	300, 600	P G	X	0.40	4.00
Iro [2]	SWT	100-150	P. Margaronis & Sons	300, 600	P G	X	0.40	4.00
Ismene [2]	TGF	150-200	Hellenic Co. of Mar. Enterprises	300, 600	P G	X	0.40	4.00
Istros [2]	SVW	150-200	S.R.M. Vlassopoulos	300, 600	P G	X	0.40	4.00
Joulia	SWB	—	—	—	—	—	—	—
Kallirroi Kapari [2]	THQ	150-200	—	300, 600	P G	X	0.40	4.00
Kalypso Vergotti [2]	SVK	150-200	Vergottis	300, 600	P G	X	0.40	4.00
Kanaris	SYJ	—	Navy	—	O	—	—	—
Kate [2]	SWZ	150-200	Lykiardopoulo	300, 600	P G	X	0.40	4.00
Katingo A. Lemon	THI	200	A. G. et Lemos	300, 600	P G	X	0.40	4.00
Kéa [2]	SWE	100-150	The National Steam Nav. Co., Ltd., of Greece	300, 600	P G	N	0.40	4.00
Keravnos	SYK	—	Navy	—	O	—	—	—
Kilkis SZC	SZC	—	Navy	—	O	—	—	—
Leon	SYL	—	Navy	—	O	—	—	—
Limnos	SZB	—	Navy	—	O	—	—	—
Livanos [2]	SWL	150-200	G. Livanos	300, 600	P G	X	0.40	4.00
Lonchi	SYC	—	Navy	—	O	—	—	—
Margarita [2]	THM	100-150	M. C. Stamatopoulos Sons	300, 600	P G	X	0.40	4.00
Maria Stathatos [2]	SWWS	150-200	D. A. Stathatos, Athens	300, 600	P G	X	0.40	4.00
Marie Z. Michalinos [2]	THN	100-150	Michalinos Maritime & Commercial Co., Ltd.	300, 600	P G	X	0.40	4.00
Maroudio Inglessi [2]	SWM	100-150	The Oriental Shipping Co., Ltd., Athens	—	—	—	—	—
Meandros [2]	SWNS	100-150	The Nat. S.N. Co., of Greece	300, 600	P G	X	0.40	4.00
Megali Hellas [2]	SVV	200-250	Comp. Nat. Hellenique de Nav.	300, 600	P G	N	0.40	4.00
Melpo [2]	SVO	150-200	A. A. Cappasis	300, 600	P G	X	0.40	4.00
Michael Bistis [2]	SWF	150-200	A. Bistis	300, 600	P G	X	0.40	4.00
Michael L. Embiricos [2]	SWY	150-200	S. G. Embiricos	300, 600	P G	X	0.40	4.00
Milos [2]	TGM	100-150	National Steam Nav. Co., Ltd., of Greece	300, 600	P G	X	0.40	4.00
Miltiades THF [2]	THF	100-150	G. M. Embiricos	300, 600	P G	X	0.40	4.00
Mykali [2]	SVF	100-150	Hellenic Co. of Mar. Enterprises	300, 600	P G	N	0.40	4.00
Nafkratousa	SYR	—	Navy	—	O	—	—	—
Nauplion [2]	THH	100-150	Hellenic Co. of Mar. Enterprises	300, 600	P G	X	0.40	4.00
Navarchos Koyndouriotis [2]	THW	150-200	Chios S.S. Co., Ltd.	300, 600	P G	X	0.40	4.00
Naxos [2]	THV	100-150	National Steam Nav. Co., Ltd., of Greece	300, 600	P G	X	0.40	4.00
Nea Ellas [2]	TGP	100-150	J. D. Crocodilos	300, 600	P G	X	0.40	4.00
Nea Gennea	SYG	—	Navy	—	O	—	—	—
Nicolaos Athanassulis [2]	SVI	100-150	A. Athanassulis	300, 600	P G	X	0.40	4.00
Nicoloas Zafirakis [2]	SWRS	150-200	Ch. Zafirakis, Chios	300, 600	P G	X	0.40	4.00
Niki	SYN	—	Navy	—	O	—	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
GREECE—*contd.*									
Nikopolis	SZD	—	Navy	—	O	—	—	—	
Nora Saliari [2]	SWN	150-200	Saliaris and Negropontes	300, **600**	P G	X	0.40	4.00	
Othon Stathatos [2]	SWQ	100-150	Othon Stathatos	300, **600**	P G	X	0.40	4.00	
Ourana [2]	SVN	100-150	P. Pantaleon Fils	300, **600**	P G	N	0.40	4.00	
Panaghis [2]	SWP	150-200	—	300, **600**	P G	X	0.40	4.00	
Panaghis Vergottis [2]	THZ	150-200	—	—	—	—	—	—	
Panthir	SYP	—	Navy	—	O	—	—	—	
Pantias Rallis [2]	SWB	100-150	Panhellénique S. N. Co.	300, **600**	P G	N	0.40	4.00	
Paralos [2]	THJ	150	National Steam Nav. Co., Ltd., of Greece	300, **600**	P G	X	0.40	4.00	
Patris [2]	SVP	140	Comp. Nat. Hellenique de Nav.	300, 450, **600**	P G	N	0.40	4.00	
Peloponissos [2]	SVD	100-150	Hellenic Co. of Mar. Enterprises	300, **600**	P G	N	0.40	4.00	
Pelops [2]	TGB	100-150	Hellenic Co. of Mar. Enterprises	300, **600**	P G	X	0.40	4.00	
Pinios [2]	TGC	100-150	Hellenic Co. of Mar. Enterprises	300, **600**	P G	X	0.40	4.00	
Polikos [2]	THC	100-150	G. G. Anghelatos	300, **600**	P G	X	0.40	4.00	
Polyktor [2]	SWXS	150-200	Giorgo Draculis, London	300, **600**	P G	X	0.40	4.00	
Popi [2]	SVBS	100-150	Epirotiki S.S. Co., Piraeus	300, **600**	P G	X	0.40	4.00	
Prodromos [2]	THP	100-150	Jean Papas	300, **600**	P G	X	0.40	4.00	
Promithefs	SZE	—	Navy	—	O	—	—	—	
Psara	SYQ	—	Navy	—	O	—	—	—	
Rokos Vergotis [2]	SVO	150-200	G. Vergotis	300, **600**	P G	X	0.40	4.00	
Rosina [2]	THR	100-150	S. G. Embiricos	300, **600**	P G	X	0.40	4.00	
Sfendoni	SYF	—	Navy	—	O	—	—	—	
Sifnos [2]	TGL	100-150	National Steam Nav. Co., Ltd. of Greece	300, **600**	P G	X	0.40	4.00	
Sparti	TGW	100-150	P. Pantaleon	300, **600**	P G	X	0.40	4.00	
Spetsai SYS	SYS	—	Navy	—	O	—	—	—	
Spetzai TGD [2]	TGD	100-150	Hellenic Co. of Mar. Enterprises	300, **600**	P G	X	0.40	4.00	
Spyridon [2]	TGG	150-200	G. Livanos	300, **600**	P G	X	0.40	4.00	
Syros [2]	TGK	100-150	National Steam Nav. Co., Ltd., of Greece	300, **600**	P G	X	0.40	4.00	
Telemachos [2]	THK	150	P. Dracoulis	300, **600**	P G	X	0.40	4.00	
Tharros [2]	THB	100-150	Oriental Shipping Co., Ltd.	300, **600**	P G	X	0.40	4.00	
Themistocles SVT [2]	SVT	—	The Nat. Steam Nav. Co., of Greece	300, 450, **600**	P G	N	0.40	4.00	
Theofano [2]	SVAS	100-150	A. Bistis Co., London	300, **600**	P G	X	0.40	4.00	
Thétis SYZ	SYZ	—	Navy	—	O	—	—	—	
Thyella	SYT	—	Navy	—	O	—	—	—	

Hydra [2]	[illegible]	100-150	National Steam Nav. Co., Ltd. of Greece	300, 600	P G	..	X	0.40	4.00
Tinos [2]	TGN	100-150	National Steam Nav. Co., Ltd. of Greece	300, 600	P G	..	X	0.40	4.00
Vassilios Destounis [2] ..	SWOS	100-150	Destounis Bros., Athens ..	300, 600	P G	..	X	0.40	4.00
Velos	SYB	—	Navy	—	O	..	—	—	—
Zakynthos [2]	SWV	100-150	G. Yanoulatos Bros.	300, 600	P G	..	X	0.40	4.00
Zannes Sifneos [2] ..	SWW	100-150	Société Orientale des Transports..	300, 600	P G	..	X	0.40	4.00
HOLLAND									
Achilles [1]	TWW	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G	..	X	0.40	4.00
Aderamin [1]	HDD	200	Van Nievelt, Goudriaan en Co.'s Stoomvart Mij.	300, 600	P G	..	X	0.40	4.00
Admiral de Ruyter [1] ..	OLG	200	Wm. H. Muller en Co.'s Algemeene Scheepvaart-Mij.	300, 600	P G	..	X	0.40	4.00
Adonis [2]	TWX	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G	..	X	0.40	4.00
Albiero [1]	TZZ	200	Van Nievelt, Goudriaan en Co.'s Stoomvaart Mij.	300, 600	P G	..	X	0.40	4.00
Alchiba [1]	TZW	200	Van Nievelt, Goudriaan en Co.'s Stoomvaart Mij.	300, 600	P G	..	X	0.40	4.00
Alcor [1]	TZX	200	Van Nievelt, Goudriaan en Co.'s Stoomvaart Mij.	300, 600	P G	..	X	0.40	4.00
Agamemnon TWY [1] ..	TWY	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G	..	X	0.40	4.00
Aldebaran HDB [1] ..	HDB	200	Van Nievelt, Goudriaan en Co.'s Stoomvaart Mij.	300, 600	P G	..	X	0.40	4.00
Alderamin	HDD	200	V. Nievelt, Goudriaan Stoomv. Mij.	300, 600	P G	..	X	0.40	4.00
Algenib [1]	PXK	200	V. Nievelt, Goudriaan Stoomv. Mij.	300, 600	P G	..	X	0.40	4.00
Alioth	HDC	200	V. Nievelt, Goudriaan Stoomv. Mij.	300, 600	P G	..	X	0.40	4.00
Alkaid [1]	PXN	125	V. Nievelt, Goudriaan Stoomv. Mij.	300, 600	P G	..	X	0.40	4.00
Alkmaar [1]	PYH	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G	..	X	0.40	4.00
Almelo [1]	PYG	200-250	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G	..	X	0.40	4.00
Alphard [1]	PXL	200	V. Nievelt Goudriaan Stoomv. Mij.	300, 600	P G	..	X	0.40	4.00
Ambon [1]	PYR	200	"Nederland" Stoomvaart Mij. ..	300, 600	P G	..	X	0.40	4.00
Ameland PIX [1] ..	PIX	50-80	Stoomvaart Mij. Triton	300, 600	P G	..	X	0.40	4.00
American PDT [1] ..	PDT	100-150	American Petroleum Co.	300, 600	P G	..	X	0.40	4.00
Amor [1]	TWZ	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G	..	X	0.40	4.00
Amsteldyk [1]	PEE	100-150	Holland-Amerika Line	300, 600	P G	..	X	0.40	4.00
Amstelland [1]	PZU	200	Kon. Hollandsche Lloyd	300, 600	P G	..	X	0.40	4.00
Amstelstroom [1] ..	TVO	200	Hollandsche Stoomb. Mij. ..	300, 600	P G	..	X	0.40	4.00
Amsterdam TXS [1] ..	TXS	200	Koninklijke Nederlandsche Stoomboot Mij.	300, 600	P G	..	X	0.40	4.00
Andijk [1]	TVA	200	"Nederland" Stoomvaart Mij...	300, 600	P G	..	X	0.40	4.00
Antenor [1]	PZL	150-200	Stoomv. Mij. Ocaan.	300, 600	P G	..	X	0.40	4.00
Anton V. Driel [1] ..	PEP	100-150	V. Driel's N/V. W. Stoomb. en Transp.	300, 600	P G	..	X	0.40	4.00
Apollo PXG [1]	PXG	200	Kon. Nederland Stoomboot Mij...	300, 600	P G	..	X	0.40	4.00
Arakan PDH [1]	PHD	100-150	Rotterdamsche Lloyd	300, 600	P G	..	X	0.40	4.00
Ares	TWV	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G	..	X	0.40	4.00
Arnhem..	TXS	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G	..	X	0.40	4.00
Artemis PDZ [1] ..	PDZ	150-200	Petroleum Mij. La Corona ..	300, 600	P G	..	X	0.40	4.00
Arundo [1]	PXA	100-150	Mij. Zeevaart (Hudig & Veder) ..	300, 600	P G	..	X	0.40	4.00
Baarn [1]	TXO	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G	..	X	0.40	4.00
Bacchus [1]	TXA	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G	..	X	0.40	4.00
Bali [1]	PIK	100-150	"Nederland" Stoomvaart Mij. ..	300, 600	P G	..	X	0.40	4.00

[1] Operated and controlled by Nederlandsche Telegraaf Maatschappij "Radio Holland," Amsterdam

[2] Normally corresponds only with other vessels of the Batavier Line or with the coast stations North Foreland Rad and Scheveníque-Port

[3] Coast charge for radiotelegrams sent through North Foreland Rad is 17 centimes per word, 1 fr. 70 centimes minimum. In additon, for radio-telegrams for the U.K., North Foreland Rad coast charge and the inland telegraph charge must be added

[4] Public correspondence, without ship charge, is admitted in the absence of official correspondence

[5] Common call for auxiliary ships of the Royal Marine: when necessary followed by the number or name of particular ship

[6] Common call for minesweepers of the Royal Marine; when necessary followed by the vessel's number

[7] Common call for submarines of the Royal Marine

[8] Public correspondence only with other vessels of the Zeeland Co., or the coast stations Scheveníque-Port and North Foreland Rad

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.
HOLLAND—*contd.*							Francs	Francs.
Banda[1]	PZM	150	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Bandoeng[1]	PFW	150	Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00
Banka[1]	PHI	100-150	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Barendrecht[1]	PXD	150	Mij. Stoomschip Barendrecht, Rotterdam	300, **600**	P G	X	0.40	4.00
Batavier II[1]	PDO	150	Wm. H. Muller & Co.	300, **600**	P R[9]	N	0.05	0.50
Batavier III[1]	PDH	200	Wm. H. Muller & Co.	**300**, 450, **600**	P R[9]	N	0.05[9]	0.50[9]
Batavier IV[1]	PDI	200	Wm. H. Muller & Co.	**300**, 450, **600**	P R[9]	N	0.05[9]	0.50[9]
Batavier V[1]	PDJ	150	Wm. H. Muller & Co.	300, **600**	P R[9]	N	0.05	0.50
Batavier VI[1]	PDG	100-150	Wm. H. Muller & Co.	300, **600**	P R[9]	N	0.05[9]	0.50[9]
Batjan[1]	PGV	100-150	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Batoe[1]	PYQ	100-150	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Bawean[1]	PHJ	100-150	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Beemsterdijk[1]	TXX	200	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Bellatrix[1]	PXQ	125	V. Nievelt, Goudriaan Stoomv. Mij.	300, **600**	P G	X	0.40	4.00
Bengkalis[1]	PHZ	100-150	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Berkelstroom[1]	TVP	200	Hollandsche Stoomb. Mij.	300, **600**	P G	X	0.40	4.00
Besoeki[1]	OLU	200	Stoomvaart Mij. Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00
Beukelsdijk[1]	TVB	200	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Beursplein[1]	TZK	200	Scheepvaart Mij. Millingen, Rotterdam	300, **600**	P G	X	0.40	4.00
Beverwijk 20[11]	HES	150	M. J. van Hattum, Beverwijk	300, **600**	P G	X	0.40	4.00
Bilderdijk[1]	TZU	200	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Billiton[1]	PGT	100-150	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Binnendijk[1]	TXZ	200	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Bintang[1]	PHV	100-150	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Birma[1]	PFR	150	Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00
Blijdendijk[1]	TZQ	200	Nederland Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Blitar[1]	OLH	200	Stoomvart Mij. Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00
Bloemfontein	TZM[1]	200	Nederl. Zuid-Afrikaansche Stoomboot Mij.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Blommersdijk[1]	TZT	200	Nederland Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Boeroe[1]	PHK	100-150	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Boeton[1]	PGU	100-150	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Bondowoso[1]	PFO	200	Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00

Remarks.

[9] For restricted service (see note 8) the total charge for messages is 40 centimes a word, minimum 4 francs. For messages sent via North Foreland Rad an additional charge of 17 centimes a word, minimum 1 fr. 70 centimes is made. For messages for the U.K. via North Foreland Rad, the coast station charge and the inland rate must be added

[10] Common call sign for Torpedo boats of the Marine Service

[11] Operated by the Compagnie d'Exploitation Radio-Electrique, Paris

Bontekoe[1]	—	—	Kon. Paketvaart Maatschappij ..	300, 600	P G ..	X	0.40	4.00
Boomberg	TYZ	200	Stoomboot Mij. Hillegersberg, Amsterdam	300, 600	P G ..	X	0.40	4.00
Borneo[1]	PHY	100-150	" Nederland " Stoomvaart Mij. ..	300, 600	P G ..	X	0.40	4.00
Boschdijk[1]	TZO	200	Nederland Stoomvaart Mij. ..	—	P G ..	X	0.40	4.00
Brabant TYT[11] ..	TYT	200	Bureau Wijsmuller, Scheepvaart Transport-en Zeesleepvaart-Mij.	300, 600	P G ..	X	0.40	4.00
Brabantia[1]	PZZ	Day 500 Night 1,000	Kon. Hollandsche Lloyd	300, 600, 1,800	P G ..	N	0.40	4.00
Breda[1]	TWU	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G ..	X	0.40	4.00
Breedijk[1]	TXY	200	Nederland Stoomvaart Mij. ..	300, 600	P G ..	X	0.40	4.00
Brielle[1]	TWT	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G ..	X	0.40	4.00
Brinio	PAV	60	Navy	300, 600	O[4] ..	—	—	—
Britsum[1]	TYY	200	Stoomvaart Mij. Oostzee, Amsterdam	300, 600	P G ..	X	0.40	4.00
Brunswijk[1]	PIV	50-80	Erhardt & Dekkers	300, 600	P G ..	X	0.40	4.00
Buitenzorg[1]	PHU	100-150	Rotterdamsche Lloyd	300, 600	P G ..	X	0.40	4.00
Bulhond	PBZ	150	Navy	300, 600	O[4] ..	—	—	—
Burgerdijk[1]	TZP	200	Nederland Stoomvaart Mij. ..	300, 600	P G ..	X	0.40	4.00
Bussum[1]	PZA	125	Stoomvaart Mij. Oostzee	300, 600	P G ..	X	0.40	4.00
Calcutta PYT[1] ..	PYT	150	" Nederland " Stoomvaart Mij. ..	300, 600	P G ..	X	0.40	4.00
Callisto[1]	PYF	200	Mij. Zeevaart	300, 600	P G ..	X	0.40	4.00
Calypso TXB[1] ..	TXB	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G ..	X	0.40	4.00
Celaeno[1]	PIY	100-150	Mij Zeevaart, Rotterdam.. ..	300, 600	P G ..	X	0.40	4.00
Celebes[1]	PGO	100-150	" Nederland " Stoomvaart Mij. ..	300, 600	P G ..	X	0.40	4.00
Ceram[1]	PYS	150	" Nederland " Stoomvaart Mij. ..	300, 600	P G ..	X	0.40	4.00
Ceres[1]	PYW	200	Kon. Nederl. Stoomb. Mij. ..	300, 600	P G ..	X	0.40	4.00
Ceylon PHE[1]	PHE	100-150	Rotterdamsche Lloyd	300, 600	P G ..	X	0.40	4.00
Clio TXC[1]	TXC	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G ..	X	0.40	4.00
Commewijne[1]	PEL	150-200	Kon. West Ind. Maildienst ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Cornelis	TYC	200	A. C. Lensen's Stoomvaart Mij...	300, 600	P G ..	X	0.40	4.00
Cornelis Drebbel[1] ..	PAY	60	Navy	300	O[4] ..	—	—	—
Crynssen[1]	PYU	200-250	Kon. West Ind. Maildienst ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Dakar	TZM	150-200	N.V. v/d Eb. & Dresselhuys ..	300, 600	P G ..	X	0.40	4.00
Dardanus[1]	PEV	150-200	Stoomvaart Mij. Oceaan	300, 600	P G ..	X	0.40	4.00
Delftland[1]	PDY	200	Kon. Hollandsche Lloyd	300, 600	P G ..	X	0.40	4.00
Delft[1]	PXW	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G ..	X	0.40	4.00
Deli[1]	PGG	100-150	Rotterdamsche Lloyd	300, 600	P G ..	X	0.40	4.00
De Ruijter	PAC	200	Navy	300, 600	O[4] ..	—	—	—
Deucalion TXQ[1] ..	TXQ	200	Kon. Nederl. Stoomboot Mij. ..	300, 600	P G ..	X	0.40	4.00
De Zeven Provincien ..	PAA	400	Navy	300, 600	O[4] ..	—	—	—
Djambi[1]	PIM	100-150	Rotterdamsche Lloyd	300, 600	P G ..	X	0.40	4.00
Djebres[1]	PGD	200	Rotterdamsche Lloyd	300, 600	P G ..	X	0.40	4.00
Djembe[1]	PHF	100-150	Rotterdamsche Lloyd	300, 600	P G ..	X	0.40	4.00
Djocjar[1]	PFU	100	Rotterdamsche Lloyd	300, 600	P G ..	X	0.40	4.00
Domburg	HEZ	200	Vrachtvaart-Mij. Bothnia ..	300, 600	P G ..	X	0.40	4.00
Drechterland[1]	PDR	150	Kon. Hollandsche Lloyd	300, 600	P G ..	X	0.40	4.00
Drechtstroom[1]	TVQ	200	Hollandsche Stoomb. Mij. ..	300, 600	P G ..	X	0.40	4.00

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
HOLLAND—*contd.*							Francs.	Francs.	
Drente [1]	PZY	100	Bureau Wijsmuller	300, **600**	P G	X	0.40	4.00	
Dubhe [1]	PXS	200	V. Nievelt Goudriaan Stoomv. Mij.	300, **600**	P G	X	0.40	4.00	
Edam [1]	TXU	500-1,000	Nederland Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Eemdijk [1]	TVI	20	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Eemland [1]	PYJ	150	Kon. Hollandsche Lloyd	300, **600**	P G	X	0.40	4.00	
Eibergen [1]	PIW	100	Furn. Scheep. & Agent. Mij.	300, **600**	P G	X	0.40	4.00	
Elisabeth [1]	TYA	200	Zuid- Nederlandsche Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Ellewoutsdyk [1]	PYP	200	Sollevold and v. d. Meer	300, **600**	P G	X	0.40	4.00	
Enggano [1]	TWM	200	Stoomvaart Mij. Nederland	300, **600**	P G	X	0.40	4.00	
Evertsen	PAN	100	Navy	300, **600**	O [4]	—	—	—	
Farmsum [1]	TYN	200	Stoomvaart Maatschappij Oostzee.	300, **600**	P G	X	0.40	4.00	
Fret	PBY	150	Navy	300, **600**	O [4]	—	—	—	
Friesland [1]	PIH	100	Bureau Wijsmuller	300, **600**	P G	X	0.40	4.00	
Frisia [1]	PEF	200-250	Kon. Hollandsche Lloyd	300, **600**	P G	N	0.40	4.00	
Friso	PAW	60	Navy	300, **600**	O	—	—	—	
Gaasterdijk [1]	TXV	200	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Gaasterland [1]	PYK	150	Kon. Hollandsche Lloyd	300, **600**	P G	X	0.40	4.00	
Ganymedes [1]	PYI	200	Kon. Nederl. Stoomboot-Mij.	300, **600**	P G	X	0.40	4.00	
Garoet [1]	PIN	100-150	Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00	
Gelderland	PAK	150	Navy	400, **600**	O [4]	—	—	—	
Gelria [1]	PEG	200-250	Kon. Hollandsche Lloyd	300, 450, **600**	P G	N	0.40	4.00	
Goentoer [1]	PFA	200	Rotterdamsche Lloyd	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00	
Gonymedes [1]	PYI	200	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00	
Gorredijk [1]	PIL	200	Holland Amerika Line	300, **600**	P G	X	0.40	4.00	
Gorontalo [1]	PGC	100-150	Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00	
Gooiland [1]	PDU	100	Kon. Hollandsche Lloyd	300, **600**	P G	X	0.40	4.00	
Gouwestroom [1]	TVR	200	Hollandsche Stoomboot Mij.	300, **600**	P G	X	0.40	4.00	
Greve (De) [1]	PMO	100	Kon. Paketvaart Mij.	300, **600**	P G	0300 to 0400 0600 to 0800 0900 to 1200 2000 to 2200	0.40	4.00	
Groningen [11]	HEB	200	Bureau Wijsmuller, Scheepvaart, Transport en Zeesleepvaart Mij.	300, **600**	P G	X	0.40	4.00	
Grootendijk [1]	TXW	200	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	

Grotius [1]	PFI	200	"Nederland" Stoomvaart Mij.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Haarlem [1]	TWR	200	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00
Hagno [1]	PXC	150	Hudig & Veder	300, **600**	P G	X	0.40	4.00
Hardenberg [1]	TYW	200	Stoomboot Maatschappij Hillegersberg	300, **600**	P G	X	0.40	4.00
Hector [1]	TWS	—	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00
Helder [1]	TXP	200	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00
Hercules TXD [1]	TXD	200	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00
Hermelijn	PBT	150	Navy	300, **600**	O [4]	—	—	—
Hermes PDX [1]	PDX	150-200	Petroleum Mij. La Corona	300, **600**	P G	X	0.40	4.00
Hermes TWQ	TWQ	—	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00
Hertog Hendrik	PAD	200	Navy	300, **600**	O [4]	—	—	—
Hillegom [1]	TYM	150-200	Mij. Stoomschip Hillegona, Rotterdam	300, **600**	P G	X	0.40	4.00
Hillegom	TYM	150-200	Gebrs. van Uden	300, **600**	P G	X	0.40	4.00
Hilversum [1]	PZD	200	Vinke & Co.	300, **600**	P G	X	0.40	4.00
Holland PAH	PAH	200	Navy	300, **600**	O [4]	—	—	—
Hollandia [1]	PEH	200-250	Kon. Hollandsche Lloyd	300, **600**	P G	N	0.40	4.00
Hontestroom [1]	TVS	200	Hollandsche Stoomboot Mij.	300	P G	X	0.40	4.00
Hulpvaartuigen	PBQ [8]	—	—	300	O [4]	—	—	—
Humber [1]	PIB	75-100	Internationale Sleepdienst Mij.	300, 450, **600**	P G	X	0.40	4.00
Hydra PAQ	PAQ	60	Navy	300, **600**	O [4]	—	—	—
Insulinde [1]	PFS	150-200	Rotterdamsche Lloyd	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Iris PHQ [1]	PHQ	150-200	Petroleum Mij. La Corona	300, **600**	P G	X	0.40	4.00
Jaarstroom [1]	TVT	200	Hollandsche Stoomboot Mij.	300, **600**	P G	X	0.40	4.00
Jacatra [1]	PFX	150	Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00
S. Jacob [1]	PMG	150	Konink. Paketvaart Mij.	300, **600**	P G	0300 to 0400 0600 to 0800 0900 to 1200 2000 to 2200	0.40	4.00
Jacob van Heemskerck HEC [11]	HEC	200	Bureau Wijsmuller Scheepvaart, Transport en Zeesleepvaart-Mij.	300, **600**	P G	X	0.40	4.00
Jacob van Heemskerck	PAL	100	Navy	300, **600**	O [4]	—	—	—
Jagerstontein [1]	HEJ	300	Nederl. Zuid-Afrika Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Jakhals	PBU	150	Navy	300, **600**	O [4]	—	—	—
Jan V. Nassau [1]	PXX	200	Kon. West Ind. Maildienst	300, **600**	P G	X	0.40	4.00
Jason PYB [1]	PYB	200	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00
Java	PGK	200	"Nederland" Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
J. B. Aug. Kessler [1]	PDV	150-200	Petroleum Mij. La Corona	300, **600**	P G	X	0.40	4.00
Jobshaven [1]	TYK	150-200	Mij. Stoomschip Jobshaven, Rotterdam	300, **600**	P G	X	0.40	4.00
Jobshaven	TYK	150-200	Gebrs. van Uden	300, **600**	P G	X	0.40	4.00
Johan de Witt [1]	PFJ	Day 500 Night 1,000	"Nederland" Stoomvaart Mij.	300, **600**, 1,800	P G	0600 to 0810 0900 to 1210 1400 to 1810 2000 to 2210	0.40	4.00
Johanna [1]	PYA	100-150	Mij. Stooms. Johanna (Jos. de Poorte)	300, **600**	P G	X	0.40	4.00

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
HOLLAND—*contd.*							Francs.	Francs.	
J. P. Coen [1]	PFL	150-200	" Nederland " Stoomvaart Mij.	300, **600**	P G	0600 to 0810 0900 to 1210 1400 to 1810 2000 to 2210	0.40	4.00	
Juno PXZ [1]	PXZ	150-200	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00	
Juno	TXE	200	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00	
Kambangan [1]	PGS	100-150	" Nederland " Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Kangean [1]	PGP	100-150	" Nederland " Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Karimata [1]	PGQ	100-150	" Nederland " Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Karimoen [1]	PGW	100-150	" Nederland " Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Katwijk [1]	TYP	200	Mij. Stoomschip Katwijk	300, **600**	P G	X	0.40	4.00	
Kawi [1]	PFD	200	Rotterdamsche Lloyd	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00	
Kediri [1]	PFY	100-150	Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00	
Keilehaven [1]	TYF	150-200	Mij. Stoomschip Keilehaven, Rotterdam	300, **600**	P G	X	0.40	4.00	
Kelbergen [1]	PIZ	100-150	Scheepv. Mij., Rotterdam	300, **600**	P G	X	0.40	4.00	
Kennemerland [1]	PYL	200	Kon. Hollandsche Lloyd	300, **600**	P G	X	0.40	4.00	
Kertosono [1]	OLK	200	Stoomvaart Mij. Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00	
Kilstroom [1]	TVU	200	Holl. Stoomb. Mij.	300, **600**	P G	X	0.40	4.00	
Kinderdijk TVH [1]	TVH	200	" Nederland " Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Kinderdyk PYY [1]	PYY	200	Solleveld, v. d. Meer	300, **600**	P G	X	0.40	4.00	
Koningin der Nederlanden [1]	PFV	200	Stoomvaart Mij. Nederland	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00	
Koningin Regentes	PAE	400	Navy	300, **600**	O [4]	—	—	—	
Kortenaer	PAM	100	Navy	300, **600**	O [4]	—	—	—	
Krakatau [1]	PGL	100-150	Nederland Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Larenberg [1]	PZC	200	Stoomboot Maatschappij Hillegersberg	300, **600**	P G	X	0.40	4.00	
Leerdam [1]	TVM	500-1,000	" Nederland " Stoomvaart Mij.	300, **600**	P G	N	0.40	4.00	
Leersum [1]	PZB	200	Vinke & Co.	300, **600**	P G	X	0.40	4.00	

Lemaire [1]	PMQ	100	Kon. Paketvaart Mij.	300, 600	P G	0300 to 0400 0600 to 0800 0900 to 1200 1700 to 1900 2000 to 2200	0.40	4.00
Limburgia [1]	PZX	Day 500 Night 1,000	Kon. Hollandsche Lloyd	330, 600, 1,800	P G	N	0.40	4.00
Lingedijk [11]	HDG	200	Solleveld, Van der Meer en T. H. van Hattum's Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Lingestroom [1]	PYN	100	Holl. Stoomboot Mij.	300, 600	P G	X	0.40	4.00
Lombok [1]	PGN	100-150	Nederland Stromvaart Mij.	300, 600	P G	X	0.40	4.00
Lynx	PBX	150	Navy	300, 600	O [4]	—	—	—
Maarten Harpertz Tromp	PAB	400	Navy	300, 600	O [4]	—	—	—
Maartensdijk [1]	PDQ	200	Holland-Amerika Line	300, 600	P G	X	0.40	4.00
Maasdam [1]	TVL	500-1,000	"Nederland" Stoomvaart Mij.	300, 600	P G	N	0.40	4.00
Maasdijk TVC [1]	TVC	200	"Nederland" Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Maasdijk TZG [11]	TZG	200	Solleveld, Van der Meer en F. H. van Hattum's Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Maashaven [1]	PXO	150	Mij. Stoomschip Maashaven	300, 600	P G	X	0.40	4.00
Maasland [1]	PYM	200	Kon. Hollandsche Lloyd	300, 600	P G	X	0.40	4.00
Macedonia [1]	PZK	100-150	Holl. Alg. Atl. Scheepv. Mij.	300, 600	P G	X	0.40	4.00
Madioen [1]	PGI	100-150	Rotterdamsche Lloyd	300, 600	P G	X	0.40	4.00
Madoera [1]	TWG	200	"Nederland" Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Magdalena TYB [1]	TYB	200	A. C. Lensen's Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Malang [1]	TZA	100	Stoomvaart Mij. Rotterdamsche Lloyd	300, 600	P G	X	0.40	4.00
Manoeran [1]	TWH	200	"Nederland" Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Mapia [1]	TWI	200	"Nederland" Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Maristo [1]	TZD	200	Van der Eb en Dresselhuys Scheepvaart Mij. Rotterdam	300, 600	P G	X	0.40	4.00
Marken [1]	PZG	100-150	Rotterdamsche Lloyd	300, 600	P G	X	0.40	4.00
Marsdiep [1]	HEM	200	Vrachtvaart Mij. Ysluis	300, 600	P G	X	0.40	4.00
Medan [1]	PGA	100-150	Rotterdamsche Lloyd	300, 600	P G	X	0.40	4.00
Medusa PAR	PAR	60	Navy	300, 600	O [4]	—	—	—
Menado [1]	PGB	100-150	Rotterdamsche Lloyd	300, 600	P G	X	0.40	4.00
Merak [1]	TZY	200	Van Nievelt, Goudrian en Co.'s Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Merauke [1]	PGE	100-150	Rotterdamsche Lloyd	300, 600	P G	X	0.40	4.00
Mercurius [1]	TXF	200	Kon. Nederl. Stoomboot Mij.	300, 600	P G	X	0.40	4.00
Merwestroom	TVY	200	Holl. Stoomboot Mij.	300, 600	P G	X	0.40	4.00
Mijdrecht	PXE	150	Mij. Stoomsch. Mijdrecht	300, 600	P G	X	0.40	4.00
Mijnenveger [6]	PAX	40	Navy	300	O [4]	—	—	—
Minerva TXG [1]	TXG	200	Kon. Nederl. Stoomboot Mij.	300, 600	P G	X	0.40	4.00
Mirach [1]	PXI	200	V. Nievelt Goudriaan Stv. Mij.	300, 600	P G	X	0.40	4.00
Mizar	HDA	200	V. Nievelt, Goudriaan & Co.'s Schv. Mij.	300, 600	P G	X	0.40	4.00
Modjokerto [1]	OLI	200	Stoomwaart Mij. Rotterdamsche Lloyd	300, 600	P G	X	0.40	4.00
Moena [1]	TWK	200	Stoomvaart Mij. Nederland	300, 600	P G	X	0.40	4.00
Moerdijk TVJ	TVJ	200	"Nederland" Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Moerdijk PYO [1]	PYO	200	Solleveld & v. d. Meer	300, 600	P G	X	0.40	4.00
Mont Blanc [1]	PDK	100	Van de Eb. & Dresselhuys	300, 600	P G	X	0.40	4.00
Mont Cenis TZC [1]	TZC	200	Van der Eb en Dresselhuys Scheepvaart Mij.	300, 600	P G	X	0.40	4.00

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks
							Francs.	Francs.	
HOLLAND—*contd.*									
Montferland [1]	PZW	200	Koninklijke Hollandsche Lloyd	300, **600**	P G	X	0.40	4.00	
Mydrecht [1]	PXE	150	Ph. van. Ommeren	300, **600**	P G	X	0.40	4.00	
Naaldwijk [1]	TYN	200	Mij. Stoomschip Randwijk	300, **600**	P G	X	0.40	4.00	
Nereus [1]	TXR	200	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00	
New York PHN [1]	PHN	100-150	American Petroleum Co.	300, **600**	P G	X	0.40	4.00	
Nias [1]	PGR	100-150	Nederland Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Nickerie [1]	PER	150-200	Kon. West. Ind. Maildienst	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00	
Nicolaas [1]	TZN	150	W. H. Berghuys Kolenhandel	300, **600**	P G	X	0.40	4.00	
Nieuw Amsterdam [1]	PEB	200-250	**Holland-Amerika Line**	300, **600**	P G	N	0.40	4.00	
Nieuwe Maas [1]	OLB	200	Hollandsche Algemeene Atlantische Scheepvaart Mij.	300, **600**	P G	X	0.40	4.00	
Noord [11]	HDK	200	Houtvaart, Rotterdam	300, **600**	P G	X	0.40	4.00	
Noordbrabant	PAJ	200	Navy	300, **600**	O [4]	—	—	—	
Noordam [1]	PEC	200-250	Holland-Amerika Line	300, **600**	P G	N	0.40	4.00	
Noorddijk [1]	PYX	100	Solleveld & v. d. Meer	300, **600**	P G	X	0.40	4.00	
Noorderdijk [1]	PDL	200	Solleveld & v. d. Meer	300, **600**	P G	X	0.40	4.00	
Noordwijk [1]	PHG	100	Erhardt & Dekkers	300, **600**	P G	X	0.40	4.00	
Nordzee [1]	TZE	200	Naamlooze Vennootschapp Stoomschip Noordzee	300, **600**	P G	X	0.40	4.00	
Oberon [1]	TXH	200	Kon. Nederl. Stoomboot Mij	300, **600**	P G	X	0.40	4.00	
Ocean PDS [1]	PDS	100-150	American Petroleum Co.	300, **600**	P G	X	0.40	4.00	
Onderzeeboot [7]	PBO	20	Navy	300	O [4]	—	—	—	
Oostdijk [1]	PZE	200	Solleveld & v. d. Meer	300, **600**	P G	X	0.40	4.00	
Oostzee [1]	PXU	150	Naamlooze Vennootsch s.s. Oostzee	300, **600**	P G	X	0.40	4.00	
Ootmarsum [1]	PXV	200	Vinke & Co.	300, **600**	P G	X	0.40	4.00	
Oranje [1]	PFP	200	"Nederland" Stoomvaart Mij.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00	
Oranje Nassau PDE	PDE	150	Stoomvaart-Mij. Zeeland	300, 500, **600**	P R [8]	N	— [8]	— [8]	
Oranje Nassau PEM [1]	PEM	150-700	Kon. West Ind. Maildienst	300, **600**	P G	0600 to 0800 0900 to 1200 1300 to 1700	0.40	4.00	

Orestes[1]	PYC	200	Kon. Nederl. Stoomb. Mij.	300, 600	P G	X	0.40	4.00
Orion HEO[1]	HEO	200	Kon. Nederl. Stoomboot Mij.	300, 600	P G	X	0.40	4.00
Overijsel[11]	HEA	200	Bureau Wijsmuller	300, 600	P G	X	0.40	4.00
Palembang[1]	PEY	200	Stoomvaart Mij. Rotterdamsche Lloyd	300, 600	P G	X	0.40	4.00
Panter	**PBS**	**150**	**Navy**	**300, 600**	**O[4]**	—	—	—
Parkhaven[1]	TYL	150-200	Mij. Stoomschip Parkhaven, Rotterdam	300, 600	P G	X	0.40	4.00
Patria[1]	**PFT**	Day 500 Night 1,000	Rotterdamsche Lloyd	300, 600, 1,800	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Patroclus[1]	**PEU**	**150-200**	**Stoomvaart Mij. Oceaan**	**300, 600**	**P G**	**X**	**0.40**	**4.00**
Peelland[1]	**PZW**	200	Kon. Hollandsche Lloyd	300, 600	**P G**	**X**	**0.40**	**4.00**
Pheeda[1]	TYD	200	Van Nievelt, Goudriaan en Co.'s Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Piet Hein	**PAO**	**100**	**Navy**	**300, 600**	O	—	—	—
Plancius[1]	—	—	**Kon. Paketvaart Maatschappij**	**300, 600**	**P G**	**X**	**0.40**	**4.00**
Poeldijk[1]	TVD	200	Nederland Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Pollux[1]	TXI	200	Kon. Nederl. Stoomboot Mij.	300, 600	P G	X	0.40	4.00
Poolzee	**PAG**	—	**Navy**	**300, 600**	O	—	—	—
Poseidon	TXT	200	Kon. Ned. Stoomboot Mij.	300, 600	P G	X	0.40	4.00
Prins der Nederlanden PEN[1]	PEN	150-200	Kon. West Ind. Maildienst	300, 600	P G	0600 to 0800 0900 to 1200 1300 to 1700	0.40	4.00
Prins de Nederlanden PFQ[1]	PFQ	200	"Nederland" Stoomvaart Mij.	300, 600	P G	0600 to 0900 1000 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Prinses Juliana PDF	PDF	150	Stoomvaart Maatschappij Zeeland	300, 600	P G[4]	N	—	—
Prinses Juliana PFN[1]	PFN	200	"Nederland" Stoomvaart Mij.	300, 600	P G	0600 to 0900 1000 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Prins Fred. Hendrik[1]	PEK	150-200	Kon. West Ind. Maildienst	300, 600	P G	0600 to 0800 0900 to 1200 1300 to 1700	0.40	4.00
Prins Hendrik	PDC	150	St.-Mij Zeeland	300, 500, 600	P R[8]	N	—[9]	—[9]
Procyon[1]	**PXR**	125	V. Nievelt Goudriaan Stmv. Mij.	300, 600	**P G**	**X**	**0.40**	**4.00**
Radja[1]	**PHA**	**100-150**	**"Nederland" Stoomvaart Mij.**	**300, 450, 600**	**P G**	**X**	**0.40**	**4.00**
Randfontein[1]	HEK	200	Nederlandsche Zuid-Afrikaansche Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Randwijk[1]	**PIU**	**50-80**	Erhardt & Dekkers	**300, 600**	**P G**	**X**	**0.40**	**4.00**
Rembrandt[1]	PFK	200	"Nederland" Stoomvaart Mij.	300, 600	P G	0600 to 0900 1000 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Rhea[1]	TXR	200	Kon. Nederl. Stoomboot Mij.	300, 600	P G	X	0.40	4.00
Ridderkerk[1]	PXF	200	Vereenigde Nederlandsche Scheepvaartmij	300, 600	P G	X	0.40	4.00
Rijn[11]	HDL	200	Houtvaart, Rotterdam	300, 600	P G	X	0.40	4.00
Rijndam[1]	**PED**	**200-250**	**Holland-Amerika Line**	**300, 600**	**P G**	**N**	**0.40**	**4.00**
Rijndijk[1]	**PYZ**	**150**	Solleveld & **V. D. Meer**	**300, 600**	**P G**	**X**	**0.40**	**4.00**
Rijnland[1]	**PDN**	**200**	Kon. Hollandsche Lloyd	**300, 600**	**P G**	**X**	**0.40**	**4.00**

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
HOLLAND—*contd.*							Francs.	Francs.	
Rijnsburg [1]	PZI	200	Vrachtvarrt-Maatschappij Bothnia	300, **600**	P G	X	0.40	4.00	
Rijswijk [1]	**PIT**	**50-80**	**Erhardt & Dekkers**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Rindjani	PFH	200	Rotterdamsche Lloyd	300, **600**	P G	0600 to 0900 1000 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Riouw [1]	**PHB**	**100-150**	**"Nederland" Stoomvaart Mij.**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Roepat [1]	**PHL**	**100-150**	**"Nederland" Stoomvaart Mij.**	**300, 450, 600**	**P G**	**X**	**0.40**	**4.00**	
Rondo [1]	**PHM**	**100-150**	**"Nederland" Stoomvaart Mij.**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Roode Zee [1]	**PIA**	**100**	**L. Smit & Co.'s Sleepdienst**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Rotterdam PEA [1]	**PEA**	**200-250**	**Holland-Amerika Line**	**300, 600**	**P G**	**N**	**0.40**	**4.00**	
Rotterdam PHH [1]	**PHH**	**100**	**American Petroleum Co.**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Rotti [1]	**PHC**	**100-150**	**"Nederland" Stoomvaart Mij.**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Rozenburg [1]	**PZS**	**150-200**	**Stoomb. "De Goede Verwachting"**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Ruurlo [1]	PDM	150	Stoomvaart-Maatschappij Noordzee	300, **600**	P G	X	0.40	4.00	
Salabangka [1]	**TWB**	200	**"Nederland" Stoomvaart Mij.**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Salatiga [1]	PEZ	200	Stoomvaart Mij. Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00	
Salawati [1]	**TWC**	200	**"Nederland" Stoomvaart Mij.**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Saleier [1]	**TWA**	200	**"Nederland" Stoomvaart Mij.**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Salland [1]	**PZJ**	**200**	**Kon. Hollandsche Lloyd**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Samarinda [1]	**PGH**	**100-150**	Rotterdamsche Lloyd	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Saparoca [1]	**TWB**	200	"Nederland" Stoomvaart Mij.	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Sarpedon [1]	**PET**	**150-200**	Stoomv. Mij. Oceaan	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Sassenheim	TYH	150	Maatschappij Stoomschip Sassenheim	300, **600**	P G	X	0.40	4.00	
Saturnus [1]	**TXJ**	**200**	Kon. Nederl. Stoomboot Mij.	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Schelde HDZ [1]	HDZ	200	Internationale Sleepdienst Mij.	300, **600**	P G	X	0.40	4.00	
Schiedijk [1]	**PIQ**	**150-200**	**Holland-Amerika Line**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Schouwen	OLS	200	Stoomvaart Mij. Triton	300, **600**	P G	X	0.40	4.00	
Scipio PXH [1]	PXH	200	Kon. Nederland Stoomboot Mij.	300, **600**	P G	X	0.40	4.00	
Scopas [1]	OMA	200	Nederlandsch-Indische tank-stoombootmij	300, **600**	P G	X	0.40	4.00	
Selene [1]	**PDW**	**150-200**	Petroleum Mij. La Corona	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Sembilan [1]	**TWF**	200	"Nederland" Stoomvaart Mij.	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Semiramis [1]	OMC	200	Nederlandsche-Indische tank-stoombootmij	300, **600**	P G	X	0.40	4.00	
Siantar [1]	OLM	200	Stoomvaart Mij. Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00	

Sigli[1]	—	—	**Kon. Paketvaart Maatschappij**	300, **600**	P G	X	0.40	4.00
Silvanus[1]	OMB	200	Nederlandsch - Indische tank-stoombootmij	300, **600**	P G	X	0.40	4.00
Simaloer[1]	**TWD**	200	**" Nederland " Stoomvaart Mij.**	300, **600**	P G	X	0.40	4.00
Sindoro[1]	PFE	200	Rotterdamsche Lloyd	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Singkep[1]	**TWJ**	200	" Nederland " Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Sirrah PXJ[1]	**PXJ**	200	V. Nievelt Goudriaan Stmv. Mij.	300, **600**	P G	X	0.40	4.00
Sitoebondo[1]	**PHT**	100-150	Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00
Slaoe[1]	—	—	Kon. Paketvaart Maatschappij	300, **600**	P G	X	0.40	4.00
Sliedrecht[1]	**PYD**	150	Ph. van. Ommeren	300, **600**	P G	X	0.40	4.00
Sloet V. D. Beele[1]	—	200	Kon. Paketvaart Mij.	300, **600**	P G	X	0.40	4.00
Soekaboemi[1]	OLL	200	Stoomvaart Mij. Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00
Soemba[1]	**TWL**	200	" Nederland " Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Soerakarta[1]	**PGJ**	100-150	Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00
Soestdijk[1]	**PHO**	200	Holland-Amerika Line	300, **600**	P G	X	0.40	4.00
Sommelsdijk[1]	**PEW**	100-150	Holland-Amerika Line	300, **600**	P G	X	0.40	4.00
Spaarndam[1]	TVN	500-1,000	Nederland Stoomvaart Mij.	300, **600**	P G	N	0.40	4.00
Stad Amsterdam[1]	**PZR**	150-200	Stoom Mij. " Stad Amsterdam "	300, **600**	P G	X	0.40	4.00
Stadsdijk	TVK	200	Holland-Amerika Line	300, **600**	P G	X	0.40	4.00
Stad Arnhem[1]	**PII**	200	Arnhemsche Scheep. Mij.	300, **600**	P G	X	0.40	4.00
Stad Dordrecht[4]	**PZP**	150-200	Stoomv. Mij. " Stad Dordrecht "	300, **600**	P G	X	0.40	4.00
Stadsdijk[1]	TVK	200	Nederland Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00
Stad Valkenburg[1]	**PIG**	200	Stoomv. Mij. Zuid Holland	300, **600**	P G	X	0.40	4.00
Stad Zaandam[1]	**PIF**	200	Stoomv. Mij. " Stad Zalt Bommel "	300, **600**	P G	X	0.40	4.00
Stad Zalt Bommel[2]	**PZQ**	150-200	Stoomv. Mij. " Stad Zalt Bommel "	300, **600**	P G	X	0.40	4.00
Stad Zwolle[1]	**PIE**	200	Stoomv. Mij. " Stad Zalt Bommel "	300, **600**	P G	X	0.40	4.00
Stella[3]	**TXK**	200	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00
Stuyvesant[1]	PEJ	200-250	Kon. West Ind. Maildienst	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Sumatra PGM[1]	**PGM**	100-150	**" Nederland " Stoomvaart Mij.**	300, **600**	P G	X	0.40	4.00
Swartenhondt[1]	—	—	**Kon. Paketvaart Maatschappij**	300, **600**	P G	X	0.40	4.00
Tabanan[1]	PFF	200	Rotterdamsche Lloyd	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Tambora[1]	PFC	200	Rotterdamsche Lloyd	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Tantalus[1]	**PES**	150-200	**Stoomv. Mij. Oceaan**	300, **600**	P G	X	0.40	4.00
Tapanoeli[1]	OLN	200	Stoomvaart Mij. Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00
Tasman[1]	—	200	**Kon. Paketvaart Mij.**	300, **600**	P G	X	0.40	4.00
Ternate[1]	PGF	100-150	Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00
Terschelling[1]	PEX	200	Stoomvaart Mij. Triton	300, **600**	P G	X	0.40	4.00
Texel[1]	OLT	200	Stoomvaart Mij. Triton	300, **600**	P G	X	0.40	4.00
Texelstroom[1]	**TVV**	200	Holl. Stoomb. Mij.	300, **600**	P G	X	0.40	4.00
Themisto[1]	**PXB**	200	Mij. Zeevaart (Hudig & Veder)	300, **600**	P G	X	0.40	4.00
Thuban[1]	**PXP**	125	V. Nievelt Goudriaan Stoomv. Mij.	300, **600**	P G	X	0.40	4.00

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
HOLLAND—*contd.*							Francs.	Francs.	
Tjandjoer [1]	OLJ	200	Stoomvaart Mij. Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00	
Tjibesar [1]	—	—	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjikalong [1]	—	200	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjikandi [1]	—	—	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Tjikarong [1]	—	200	Java, China, Japan Line	300, **600**	P G	X	0.40	4.00	
Toba TZB [1]	TZB	200	Stoomvaart Mij. Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00	
Torpedoboot [10]	PAG	40	Navy	300	O [4]	—	—	—	
Tosari [1]	PIO	100-150	Rotterdamsche Lloyd	300, **600**	P G	X	0.40	4.00	
Triton	TXL	200	Kon. Nederl. Stoomboot Mij.	300, **600**	P G	X	0.40	4.00	
Triton	PAT	40	Navy	300	O [4]	—	—	—	
Trompenberg [1]	PZF	150-200	Stoomb. Mij. Hillegersberg	300, **600**	P G	X	0.40	4.00	
Turbinia PHR.	PHR	100-150	Stoomv. Mij. Rotterdam	300, **600**	P G	X	0.40	4.00	
Ubbergen [1]	PYF	100	Furn Scheep. V. Agent. Mij.	300, **600**	P G	X	0.40	4.00	
Ulysses [1]	PYV	200	Kon. Nederl. Stoomb. Mij	300, **600**	P G	X	0.40	4.00	
Valkenburg [1]	PIG	200	Scheepvaart Mij. Zuid-Holland	300, **600**	P G	X	0.40	4.00	
Van Hoorn	PMB	100	Kon. Paketvaart Mij.	300, **600**	P G	0300 to 0400 0600 to 0800 0900 to 1200 1700 to 1900 2000 to 2200	0.40	4.00	
Van Imhoff	—	200	Kon. Paketvaart Mij.	300, **600**	P G	X	0.40	4.00	
Van Linschoten	—	200	Kon. Paketvaart Mij.	300, **600**	P G	X	0.40	4.00	
Van Rensselaer	PEQ	200 250	Kon. West Ind. Maildienst	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00	
Van Waerwyk	PMB	150	Kon. Paketvaart Mij.	300, **600**	P G	0300 to 0400 0600 to 0800 0900 to 1200 2000 to 2200	0.40	4.00	
Van der Wyck	—	—	Kon. Paketvaart Mij.	300, **600**	P G	X	0.40	4.00	
Vecht [11]	TZR	200	Houtvaart, Rotterdam	300, **600**	P G	X	0.40	4.00	
Vechtdijk TVG [1]	TVG	200	Nederl.-Am. Stoomvaart-Mij.	300, **600**	P G	X	0.40	4.00	
Vechtdijk HDR [11]	HDR	200 200	Solleveld, Van der Meer en T.H. van Hattum's Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Veendijk [1]	PIR		Holland-Amerika Line	300, **600**	P G	X	0.40	4.00	
Veerhaven	TYJ	150-200	Gebrs. van Uden	300, **600**	P G	X	0.40	4.00	

Station	No.	Call	Power	Owner	Wave	Service	Hours		
Venus HEP	[1]	HEP	200	Kon. Nederl. Stoomboot Mij.	300, 600	P G	X	0.40	4.00
Vesta TXM	[1]	TXM	200	Kon. Nederl. Stoomboot Mij.	300, 600	P G	X	0.40	4.00
Vlieland	[1]	OLV	200	Stoomvaart Mij. Triton	300, 600	P G	X	0.40	4.00
Vondel	[1]	PFM	200 200	"Nederland" Stoomvaart Mij.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Voorburg	[1]	PHS		Vrachtvaart-Maatschappij Bothnia	300, 600	P G	X	0.40	4.00
Vorwaarts		PBG	100-150	Navy	300	O [4]	—	—	—
Vos		PBV	40	Navy	300, 600	O [4]	—	—	—
Vredenburg	[1]	HEV	150 200	Scheepvaart-en Transport Mij. Atlantica	300, 600	P G	X	0.40	4.00
Vreewijk	[1]	TYO		Mij. Stoomschip Winterswijk	300, 600	P G	X	0.40	4.00
Vulcanus TXN	[1]	TXN	200	Kon. Nederl. Stoomboot Mij.	—	P G	X	0.40	4.00
Vulcanus		PAS	200	Navy	300	O [4]	—	—	—
Waaldijk	[1]	PGY	40	Holland-Amerika Line	300, 600	P G	X	0.40	4.00
Waalhaven		TYI	100-150	Gebrs. van Uden	300, 600	P G	X	0.40	4.00
Waalstroom	[1]	TVW	200	Holl. Stoomb. Mij.	300, 600	P G	X	0.40	4.00
Walcheren	[1]	PFZ	200	Stoomv. Mij. Triton	300, 600	P G	X	0.40	4.00
Warszawa PHX	[1]	PHX	100-150 200	"Nederland" Stoomvaart Mij.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Wassenaar	[1]	TYG	150-200	Mij. Stoomschip Wassenaar, Rotterdam	300, 600	P G	X	0.40	4.00
Waterland	[1]	PZN		Kon. Hollandsche Lloyd	300, 600	P G	X	0.40	4.00
Westerdijk PGZ	[1]	PGZ	200	Holland-Amerika Line	300, 450, 600	P G	X	0.40	4.00
Westerdijk PZT	[1]	PZT	200	Solleveld & V. D. Meer	300, 600	P G	X	0.40	4.00
Westplein	[1]	TZL	200	Scheepvaart Mij. Millingen	300, 600	P G	X	0.40	4.00
Wieldrecht	[1]	PYE	200	Ph. Van Ommeren	300, 600	P G	X	0.40	4.00
Wieringen	[1]	OLW	200	Stoomvaart Mij. Rotterdam	300, 600	P G	X	0.40	4.00
Wilis	[1]	PFG	200 200	Rotterdamsche Lloyd	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	4.00
Willem Barentsz	[11]	HED	200	Bureau Wijsmuller	300, 600	P G	X	0.40	4.00
Willem V. Driel S R	[1]	PHW	100-150	V. Driel's Co.	300, 600	P G	X	0.40	4.00
Wonsum	[1]	TYU	200	Stoomvaart Maatschappij Oostzee	300, 600	P G	X	0.40	4.00
Winterswijk	[1]	PIS	50-80	Erhardt & Dekkers	300, 600	P G	X	0.40	4.00
Witte Zee	[1]	PIC	75-125	L. Smit & Co.'s Sleepdienst	300, 600	P G	X	0.40	4.00
Wolf		PBW	150	Navy	300, 600	O [4]	—	—	—
Wolsum	[1]	TYV	200	Stoomvaart Maatschappij Oostzee	300, 600	P G	X	0.40	4.00
Yildum	[1]	PXM	125	V. Nievelt, Goudriaan Stoom. Mij	300, 600	P G	X	0.40	4.00
Yseldijk	[1]	PIP	150-200	Nederland Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Yselhaven		TYE	200	Mij. Stoomschip Yselhaven	300, 600	P G	X	0.40	4.00
Yselveer	[1]	TZF	200	Scheepvaart Mij. Yselveer, Rotterdam.	300, 600	P G	X	0.40	4.00
Zaandijk HDH	[11]	HDH	200	Solleveld, Van der Meer en T.H. van Hattum's Stoomvaart Mij.	300, 600	P G	X	0.40	4.00
Zaandijk	[1]	PIJ	200	Holland-Amerika Line	—	P G	—	0.40	4.00
Zaanland	[1]	PZO	200	Kon. Hollandsche Lloyd	300, 600	P G	X	0.40	4.00
Zaanstroom	[1]	TVX	200	Holl. Stoomb. Mij.	300, 600	P G	X	0.40	4.00
Zeehond		PAZ	100	Navy	300, 600	O [4]	—	—	—
Zeeland PDA		PDA	150	Stoomv. Mij. Zeeland	300, 600	P R [8]	N [9]	0.40	4.00
Zeeland PAF		PAF	200	Navy	300, 600	O [4]	—	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
HOLLAND—*contd.*							Francs.	Francs.	
Zeeland PZV [1]	PZV	150	Bureau Wysmuller	300, **600**	P G	—	0.40	4.00	
Zeelandia [1]	**PBI**	**200-250**	**Kon. Hollandsche Lloyd**	300, **600**	P G	N	0.40	4.00	
Zijldijk [1]	TVF	200	Nederland Stoomvaart Mij.	300, **600**	P G	X	0.40	4.00	
Zuid-Holland [1]	**PZH**	**200**	**Scheepv. & Steenk. Mij.**	300, **600**	P G	X	0.40	4.00	
Zuiderdyk [1]	**PHP**	**200**	**Holland-Amerika Line**	300, **600**	P G	X	0.40	4.00	
Zwarte Zee PID [1]	**PID**	75-125	**L. Smit & Co.'s Sleepdienst.**	300, **600**	P G	X	0.40	4.00	
Zwarte Zee PXT [1]	PXT	100-150	Naamloose Vennootschap S.S. Zwarte Zee	300, **600**	P G	X	0.40	4.00	
HONDURAS (REPUBLIC OF)									
Tegucifalpa [1]	**VB**	—	**Vaccaro Bros. & Co.**	—	P G	X	0.40	—	[1] Operated and controlled by the Radio Corpn. of America
Yoro [1]	VY	—	Vaccaro Bros. & Co.	—	P G	X	0.40	—	
HONG-KONG									
Lightning [2]	VUL	—	British India S.N. Co.	—	—	—	—	—	[1] Operated and controlled by the Marconi International Mar. Com. Co., Ltd., London. [2] Operated by Siemens Bros. & Co., Ltd., Woolwich, London, S.E. [3] Accounts are settled through Siemens Bros. & Co., Ltd., Woolwich, London
Aspinet [2]	GTY	**125**	Standard Transport Co., Ltd.	300, **600**	P	X	—	—	
Hermeline [1]	YUF	—	**Furness, Withy & Co., Ltd.**	—	—	—	—	—	
Jehangir	BRA	—	Lan Sin Chuen	—	—	—	—	—	
Laertes [1]	**MYX**	—	A. Holt & Co.	—	—	—	—	—	
Masconomo [3]	GTR	150	Standard Transport Co., Ltd.	300, 450, **600**	P G	X	—	—	
Massassot [3]	PTB	150	Standard Transport Co., Ltd.	300, 450, **600**	P G	—	—	—	
Nile VRE [1]	VRE	150	Nile S.S. Co.	300, **600**	P G	X	0.40	4.00	
Oneka [3]	GTV	150	Standard Transport Co., Ltd.	300, 450, **600**	P G	X	—	—	
Samoset [3]	NUU	125	Standard Transport Co., Ltd.	300, **600**	P	X	—	—	
Satanta [3]	**KZS**	125	Standard Transport Co., Ltd.	300, **600**	P	X	—	—	
Sequoya [3]	GQE	150	Standard Transport Co., Ltd.	300, 450, **600**	P G	X	—	—	
Shabonee [3]	GSS	150	Standard Transport Co., Ltd.	300, 450, **600**	P G	X	—	—	
Tacoma GZH [3]	GZH	150	Standard Transport Co., Ltd.	300, 450, **600**	P G	X	—	—	
Tahchee [3]	GSI	150	Standard Transport Co., Ltd.	300, 450, **600**	P G	X	—	—	
Tamaha [3]	GSG	150	Standard Transport Co., Ltd.	300, 450, **600**	P G	X	—	—	
Tascalusa [3]	GSD	150	Standard Transport Co., Ltd.	300, 450, **600**	P G	X	—	—	
Tecumseh [3]	BLR	150	Standard Transport Co., Ltd.	300, 150, **600**	P G	X	—	—	
Uncus GSA [3]	GSA	150	Standard Transport Co., Ltd.	300, 450, **600**	P G	X	—	—	
Wabasha [3]	GTN	150	Standard Transport Co., Ltd.	300, 450, **600**	P G	X	—	—	
Wapello [3]	—	125	Standard Transport Co., Ltd.	300, **600**	P	X	—	—	

Name	Call	Power	Owner	Wavelengths	Service				
Winamac [2]	GSM	150	Standard Transport Co., Ltd. ..	300, 450, 600	P G ..	X	—	—	
ICELAND									
Egill Skallagrimsson ..	TFJ	150	Kiveldulfur Co., Reykjavik ..	300, 600	P ..	X	—	—	
Gullfoss [1]	TFG	200	Eimskipafjelag Isles	300, 600	P G ..	X	0.40	4.00	
Lagarfoss [2]	TFL	200	Eimskipafjelag Islands, Reykjavik	300, 600	P G ..	X	0.40	4.00	
Skallagrimur	TFR	100	Kveldulfur Co., Reykjavik ..	300, 600	P ..	X	—	—	
Sterling TFS [2] ..	TFS	180	Icelandic State	300, 600	P G ..	X	0.40	4.00	
Thor TFI	TFI	100	Bjorgunarfjelag Vestmannaeyia..	300, 600	P ..	X	—	—	
Thorolfur	TFO	150	Kveldulfur Co.	300, 600	P ..	X	—	—	
INDIA									
Ahmedi [2]	VWBM	90	Eastern Steam Navigation Co. ..	300, 450, 600	P G ..	X	0.40	—	
Arratoon Apcar [2] ..	VUE	—	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Catherine Apcar [2] ..	VUF	160	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Clive [1]	VUV	200	R. Ind. Marine	300, 600	O ..	X	—	—	
Dalhousie [1] ..	VUX	—	R. Ind. Marine	—	O ..	X	—	—	
Dara [2]	VUQ	200	Bombay and Persia S.N. Co., Ltd.	300, 600	P G ..	N	0.40	—	
Dufferin [1] ..	VUB	150	R. Ind. Marine	600	O ..	X	—	—	
Franz Ferdinand [1] ..	VUY	—	—	—	O ..	X	—	—	
Gregory Apcar [2] ..	VUR	200	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Hardinge [1] ..	VUC	250	R. Ind. Marine	300, 600, 1,000	O ..	X	—	—	
Hejaz [2]	VWBG	150	Arab Steamers, Ltd.	300, 600	P G ..	X	0.40	—	
Homayun [2] ..	VUJ	200	Bombay and Persia S.N. Co., Ltd.	300, 450, 600	P G ..	X	0.40	—	
Investigator [3] ..	VUT	150	R. Ind. Marine	600	O ..	X	—	—	
Japan	VUG [2]	170	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Jeddah [2] ..	VWBJ	220	Arab Steamers, Ltd.	300, 600	P G ..	X	0.40	—	
Kara Denia [1] ..	VUZ	—	—	—	O ..	X	—	—	
Koweit [2]	VWBK	200	Arab Steamers, Ltd.	300, 600	P G ..	X	0.40	—	
Lawrence VUW [1] ..	VUW	200	R. Ind. Marine	300, 600	O ..	X	—	—	
Lightning [2] ..	VUL	200	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Loyalty [2]	VWBL	250	Scindia S.N. Co., Ltd.	300, 450, 600	P G ..	X	0.40	—	
Minto [1]	VUM	200	R. Ind. Marine	600	O ..	X	—	—	
Naderi [2]	VUK	80	Bombay and Persia S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Nearchus [1] ..	VUA	200	R. Ind. Marine	600	O ..	X	—	—	
Northbrook [1] ..	VUD	200	R. Ind. Marine	300, 450, 600, 1,000	O ..	X	—	—	
Patrick Stewart [1] ..	VUP	100	Indo-European Telegraph Co. ..	300, 600	O ..	X	—	—	
Sandheads [2] ..	VWS	200	River Hooghly Pilot Vessel ..	300, 600	—[4]	—[5]	—	—	
Seang Bee [2] ..	VWCB	200	Lin Chin Tsong (Seang Line) ..	300, 600	P G ..	N	0.40	—	
Shuja [2]	VUS	200	Bombay and Persia S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Shushtar [2] ..	VWBS	150	Persian Gulf Steam Nav. Co., Ltd.	300, 450, 600	P G ..	X	0.40	—	
ITALY									
Acerbi	IFP	—	Navy	300, 600	—	—	—	—	
Acheronte	IFX	—	Navy	300, 600	—	—	—	—	
Ada IOW [1]	IOW	110	Alessandro Aboaf...	300, 600	—	—	—	—	
Ada O [2]	IAA	140	Ente Trasporto Cotoni	300, 600	P ..	X	0.40	—	
Adda [2]	IPG	110	Gestione a Vapore Adda	300, 600	P ..	X	0.40	—	

Iceland notes:
[1] Operated by the owners
[2] Operated by Eimskipafjelag Islands, Reykjavik

India notes:
[1] Operated and controlled by the owners
[2] Operated by the Marconi International Marine Com. Co., Ltd., London
[3] Operated by the Indian Telegraph Department
[4] Deals with special traffic through Calcutta Radio, and distress calls
[5] 6-8 a.m., 10-12 a.m., 2-4 p.m., 6-7 p.m. (Indian standard time, 5 hours 30 minutes in advance of Greenwich mean time)

Italy notes:
[1] Operated by the Compania Internazionale Marconi per le Comunicazioni Marittime, Rome
[2] Operated and controlled by the owner

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
ITALY—*contd.*							Francs.	Francs.	
Adriatico [1]	[illegible]	190	Ferrovi. dello Stato	300, **600**	P	X	0.40	—	
Affinita [1]	IOH	110	Lloyd Pacifico	300, **600**	P	X	0.40	—	
Africa [1]	IAZ	140	Lloyd Triestino	300, **600**	—	—	—	—	
Agatocle [1]	IWC	—	Cappuccio Carmelo	—	—	—	—	—	
Agios Georgios [1]	ITM	140	Marittime Italiana	300, **600**	P	X	0.40	—	
Agnello Ciampa [1]	IXY	110	Francesco Ciampa	300, **600**	P	X	0.40	—	
Agordat	IKR	—	Navy	—	—	—	—	—	
Alacrita [1]	IOL	—	Lloyd Pacifico	300, **600**	P	X	0.40	—	
Albania [1]	IOM	110	Soc. It. Serv. Marittimi	300, **600**	P G	X	0.40	—	
Albano [1]	IMQ	140	Soc. It. Serv. Marittimi	300, **600**	P	X	0.40	—	
Albaro [1]	IAB	—	—	—	—	—	—	—	
Alberto Cavalletto [1]	ILF	200	Ferrovi. dello Stato	300, **600**	P	X	0.40	—	
Alberto Treves [1]	IWG	190	Soc. Ven. Nav. a Vapore	300, **600**	P	X	0.40	—	
Alcana [1]	IXB	110	Lloyd Mediterranio	300, **600**	P	X	0.40	—	
Alcazar [1]	IWZ	—	Merli e Lugaro	—	—	—	—	—	
Alessandro A. [1]	IOX	140	Alessandro Abo.	300, **600**	P	X	0.40	—	
Alpino	IIE	—	Navy	—	—	—	—	—	
Amalfi [1]	IMD	140	Ferrovi dello Stato	300, **600**	P	X	0,40	—	
America [1]	IZA	270	Nav. Generale Italiana	300, **600**	P G	N	0.40	—	
Amerigo Vespucci	IGG	—	Navy	—	—	—	—	—	
Amista [1]	IOI	110	Lloyd del Pacifico	300, **600**	P	X	0.40	—	
Ammiraglio Bettolo [1]	ION	190	Trans. Ital. Soc. de Nav.	300, **600**	P G	N	0.40	—	
Ammiraglio Magnaghi	IGR	—	Navy	—	—	—	—	—	
Ammiraglio Saint Bon	IHV	—	Navy	—	—	—	—	—	
A. Mosto	IJH	—	Navy	—	—	—	—	—	
Ancona [1]	ILC	200	Ferrovi. dello Stato	300, **600**	P	X	0.40	—	
Andrea [1]	IXG	—	Dall' Orso e Co.	300, **600**	P	X	0.40	—	
Andrea Doria	IHA	—	Navy	—	—	—	—	—	
Angelica Accame [1]	IPH	110	Flli. Accame di Luigi	300, **600**	P	X	0.40	—	
Angelo Brunetti [1]	IMY	170	Ferrovi. dello Stato	300, **600**	—	—	—	—	
Angelo Scarsellini [1]	IUK	170	Ferrovi. dello Stato	300, **600**	P	X	0.40	—	
Angelo Toso [1]	INN	190	Societa Nazionale de Nav.	300, **600**	P	X	0.40	—	
Angelo Bondi [1]	IAP	190	Lloyd Mediterranio	300, **600**	P	X	0.40	—	
Animoso	IID	—	Navy	—	—	—	—	—	
Ansaldo 1 [1]	IXV	140	Soc. Nazionale di Nav.	300, **600**	P	X	0.40	—	
Ansaldo 2 [1]	IXP	140	Soc. Nazionale di Nav.	300, **600**	P	X	0.40	—	
Ansaldo 3 [1]	IUR	140	Soc. Nazionale di Nav.	300, **600**	P	X	0.40	—	
Ansaldo 4 [1]	ILY	140	Soc. Nazionale di Nav.	300, **600**	P	X	0.40	—	
Ansaldo 5 [1]	ILT	140	Soc. Nazionale di Nav.	300, **600**	P	X	0.40	—	

Ansaldo 6[1]	IAC	140	**Soc. Nazionale di Nav.**	300, 600	P ..	X	0.40	—
Ansaldo S. Giorgio 1[1]	IVI	140	**Soc. Nazionale di Nav.**	300, 600	P ..	X	0.40	—
Ansaldo S. Giorgio 2[1]	IAH	140	**Soc. Nazionale di Nav.**	300, 600	P ..	X	0.40	—
Ansaldo S. Giorgio 3[1]	IAI	140	**Soc. Nazionale di Nav.**	300, 600	P ..	X	0.40	—
Anteo	IFH	—	**Navy**	—	—	—	—	—
Antonietta Accame[1] ..	IOF	190	**Luigi Antioco Flli. Accame** ..	300, 600	P ..	X	0.40	—
Antonio[1]	IWL	140	**Lloyd Mediterranio**	300, 600	P ..	X	0.40	—
A. Poerio	IFA	—	Navy	—	—	—	—	—
Aquila	IJP	—	Navy	—	—	—	—	—
Aquilone	IIW	—	Navy	—	—	—	—	—
Archimede	IGF	—	Navy	—	—	—	—	—
Ardente	IIB	—	Navy	—	—	—	—	—
Ardito	IIA	—	Navy	—	—	—	—	—
Argentina[1]	ITP	190	Flli. Cosulich Trieste	300, 600	P G ..	X	0.40	—
A. Riboty	IFF	—	Navy	—	—	—	—	—
Armando[1]	ITO	140	Nav. Generale Italiana	300, 600	P ..	X	0.40	—
Arnaldo da Brescia[1] ..	IMK	190	Ferrovi. dello Stato	300, 600	P ..	X	0.40	—
Artigliere	IIG	—	Navy	—	—	—	—	—
Ascaro	IJF	—	Navy	—	—	—	—	—
Assiria[1]	IOY	110	Soc. Meritt. Italiana	300, 600	P ..	X	0.40	—
Aster[1]	IUY	140	Edoardo Mazza	300, 600	—	—	0.40	—
Atlanta[1]	IEN	190	Ferrovi. dello Stato	300, 600	P ..	X	0.40	—
Atlante	IKW	—	Navy	—	—	—	—	—
Attualita[1]	IAR	140	Lloyd Pacifico	300, 600	P ..	X	0.40	—
Audace	IIC	—	Navy	—	—	—	—	—
Aurania[1]	IVA	110	Lloyd Mediterranio	300, 600	P ..	X	0.40	—
Balena	IFW	—	Navy	—	—	—	—	—
Bagnoli[1]	IXO	190	Lloyd Mediterranio	300, 600	P ..	X	0.40	—
Barbarigo[1]	IUZ	140	S. Ven. Nav. a Vapore	300, 600	P ..	X	0.40	—
Baron Call[1]	IXU	140	Lloyd Triestino	300, 600	P G ..	X	0.40	—
Basilicata	IKL	—	Navy	—	—	—	—	—
Bastia[1]	ILJ	140	Ferrovi. dello Stato	300, 600	P ..	X	0.40	—
Battinin Accame[1] ..	IOD	170	Salvatore a Emanuele Flli. Accame	300, 600	P ..	X	0.40	—
Bayonne[1]	ILB	190	Columbia Soc.	300, 600	P ..	X	0.40	—
Belluno[1]	ILP	100	Ferrovi. dello Stato	300, 600	—	—	0.40	—
Belvedere TX[1] ..	ITX	190	Flli. Cosulich, S.A.	300, 600	P G ..	N	0.40	—
Bengasi	IGI	—	Navy	—	—	—	—	—
Bengasi 2[1]	IAW	140	Servizi Marittimi	300, 600	P ..	X	0.40	—
Berenice[1]	IYE	170	Sicilia Soc. de Nav.	300, 600	P ..	X	0.40	—
Bersagliere	IIH	—	Navy	—	—	—	—	—
Bertani	IJX	—	Navy	—	—	—	—	—
Bologna[1]	ITB	190	La Veloce Soc. de Nav. a Vapore ..	300, 600	P G ..	N	0.40	—
Bolsena[1]	ILA	140	Servizi Marittimi	300, 600	P ..	X	0.40	—
Bolzaneto[1]	IOK	110	Lloyd Mediterranio	300, 600	P ..	X	0.40	—
Borea	III	—	Navy	—	—	—	—	—
Bormida[1]	IOO	140	Servizi Marittimi	300, 600	P ..	X	0.40	—
Brasile[1]	IED	190	Soc. Transoceanica	300, 600	P G ..	X	0.40	—
Brenta[1]	IAF	190	Nav. Gén. Italiana	300, 600	P ..	X	0.40	—
Brento[1]	IOU	—	Soc. Amatori Liguri Lombardi ..	—	—	—	—	—
Brescia **ILZ**[1]	ILZ	200	Ferrovi. dello Stato	300, 600	P ..	X	0.40	—
Bronte IGA	IGA	—	Navy	—	—	—	—	—
Bucovina[1]	IYG	140	Lloyd Triestino	300, 600	P G ..	X	0.40	
Bulgaria[1]	IOP	140	Servizi Marittimi	300, 600	P G ..	X	0.40	—
Caboto[1]	ITJ	190	Soc. Venez. Nav. a Vapore ..	300, 600	P ..	X	0.40	—
Cagliari[1]	INK	140	Sicilia Soc. di Nav.	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
ITALY—*contd.*							Francs.	Francs.	
Calabria IKN	IKN	—	Navy	—	—	—	—	—	
Calimeris [1]	IUQ	170	Soc. Naz. di Navigazione	300, **600**	P	X	0.40	—	
Campania IKM	IKM	—	Navy	—	—	—	—	—	
Campania IYQ [1]	IYQ	140	Luigi Pittaluga	300, **600**	P	X	0.40	—	
Cannosa [1]	IVQ	190	Soc. Libera Triestina	300, **600**	—	—	0.40	—	
Capitano Verri	IGS	—	Navy	—	—	—	—	—	
Capodimonte [1]	ILI	190	Maritima Italiana	300, **600**	—	—	0.40	—	
Caprera [1]	IWI	140	Nav. Gén. Italiana	300, **600**	P	X	0.40	—	
Capri [1]	ING	190	Maritima Italiana	300, **600**	P	X	0.40	—	
Carabiniere	IIJ	—	Navy	—	—	—	—	—	
C. A. Racchia	IFE	—	—	—	—	—	—	—	
Cariddi [1]	IMC	140	Sicilia Soc. de Nav.	300, **600**	P G	X	0.40	—	
Carignano [1]	IOR	190	Lloyd Sabaudo	300, **600**	P	X	0.40	—	
Carlo Alberto	IGU	—	Navy	—	—	—	—	—	
Carlo Pisacane [1]	ILK	190	Ferrovi. dello Stato	300, **600**	P	X	0.40	—	
Caserta [1]	IYZ	190	Nav. Generale Italiana	300, **600**	P G	N	0.40	—	
Castelporziano [1]	ITW	140	Lloyd Sabaudo	300, **600**	—	—	0.40	—	
Catania IMJ [1]	IMJ	190	Ferrovi. dello Stato	300, **600**	P G	X	0.40	—	
Caterina Accame [1]	IPO	110	Flli. Accame di Luigi	300, **600**	P	X	0.40	—	
Cavi [1]	IXD	140	Soc. Prod. Ch. Colla Conc. Roma	300, **600**	P	X	0.40	—	
Cerea [1]	ITL	140	Alta Italia	300, **600**	P	X	0.40	—	
Cervino [1]	ILR	190	Ferrovi. dello Stato	300, **600**	—	—	0.40	—	
Cesare Battisti [1]	IND	190	Transatlantica Italiana	300, **600**	P G	N	0.40	—	
Cetina [1]	IVP	190	Libera Triestina	300, **600**	—	—	0.40	—	
Chile [1]	IOJ	—	Lloyd Pacifico	—	—	—	—	—	
Ciclope	IGQ	—	Navy	—	—	—	—	—	
Cirenaici	IGR	—	Navy	—	—	—	—	—	
Circe [1]	ITZ	—	Nav. Generale Italiana	—	—	—	—	—	
Città di Bengasi [1]	IUI	190	Ferrovi. dello Stato	300, **600**	P G	X	0.40	—	
Città di Cagliari [1]	IAK	190	Ferrovi. dello Stato	300, **600**	P	X	0.40	—	
Città di Catania [1]	IET	190	Ferrovi. dello Stato	300, **600**	P G	N	0.40	—	
Città di Milano	IGJ	—	Navy	—	—	—	—	—	
Città di Palermo [1]	IWB	110	S. An. Genovese Ar. e Trasp.	300, **600**	P	X	0.40	—	
Città di Porto Maurizio [1]	IWX	—	Felice Bensa	—	—	—	—	—	
Città di Siracusa [1]	IBS	190	Ferrovi. dello Stato	300, **600**	P G	X	0.40	—	
Città di Trieste [1]	INB	190	Sicilia	300, **600**	P G	X	0.40	—	
Città di Tripoli [1]	INP	190	Sicilia	300, **600**	P G	X	0.40	—	
Città di Venezia [1]	IBF	—	S. An. Adriatica	—	—	—	—	—	
Cleopatra [1]	ILI	—	—	—	—	—	—	—	

Clio[1]	IUB	—	Nav. Generale Italiana	—	—	—	—	—
C. Mirabello	IFD	—	Navy	—	—	—	—	—
Coatit	IKS	—	Navy	—	—	—	—	—
Cocito	IFJ	—	Navy	—	—	—	—	—
Cogne[1]	IMF	—	Soc. Nazionale	300, 600	P	X	0.40	—
Colomba[1]	IXH	—	Lloyd Mediterraneo	300, 600	P	X	0.40	—
Coltano[1]	IZF	140	La Polare	300, 600	P	X	0.40	—
Columbia IWM[1]	IWM	140	Flli. Cosulich	300, 600	P G	X	0.40	—
Confidenza[1]	ITC	—	Corrado Andrea	300, 600	P	X	0.40	—
Conte di Cavour	IHD	—	Navy	—	—	—	—	—
Corazzierre	IIK	—	Navy	—	—	—	—	—
Cortellazzo	IGJ	—	Navy	—	—	—	—	—
Costantinopoli[1]	IOQ	170	Soc. Ital. Ser. Marittimi	300, 600	P	X	0.40	—
Crema[1]	ILG	100	Ferrovi. dello Stato	300, 600	P	X	0.40	—
Cunfida	IFQ	—	Navy	—	—	—	—	—
Curzo[1]	IZS	140	Soc. An Nafra (Milano)	300, 600	—	—	0.40	—
Dandolo	IHH	—	Navy	—	—	—	—	—
Dante Alighieri IUH[1]	IUH	270	Transatlantica Italiana	300 600	P G	N	0.40	—
Dante Alighieri IHC	IHC	—	Navy	—	—	—	—	—
D'Aosta[1]	IZB	140	La Polare, S.A.	300, 600	P	X	0.40	—
Dardo	IIL	—	Navy	—	—	—	—	—
Derna[1]	IAX	140	Servizi Marittimi	300, 600	P	X	0.40	—
Dinnamare[1]	IEY	140	Transoceanica	300, 600	P	X	0.40	—
Doen Samud[1]	ITD	120	Ferrovi. dello Stato	300, 600	P	X	0.40	—
Dora Baltea[1]	ITK	110	Alta Italia	300, 600	P	X	0.40	—
Duca D'Aostar[1]	IZT	270	Nav. Generale Italiana	300, 600	P G	N	0.40	—
Duca degli Abuzzi[1]	IZZ	270	Nav. Generale Italiana	300, 600	P G	N	0.40	—
Duilio	IHB	—	Navy	—	—	—	—	—
E. Carlotto	IFN	—	Navy	—	—	—	—	—
Egadi[1]	IPA	140	Marittima Italiana	300, 600	P	X	0.40	—
Elba IKI	IKI	—	Navy	—	—	—	—	—
Elba IOC[1]	IOC	170	Lloyd Mediterraneo	300, 600	P	X	0.40	—
Electra	ICCM	—	Senatore G. Marconi	—	—	—	—	—
Elettrico[1]	IYX	140	Servizi Marittimi	300, 600	P	X	0.40	—
Eliopoli[1]	IWU	—	Fratelli Bozzo	300, 600	P	X	0.40	—
Emanuele Filiberto	IHW	—	Navy	—	—	—	—	—
Entella[1]	INW	140	Sicilia	300, 600	P	X	0.40	—
Ercole	IHX	—	Navy	—	—	—	—	—
Eridano	IGO	—	Navy	—	—	—	—	—
Eritrea	IGX	—	Navy	—	—	—	—	—
Esperia IZP[1]	IZP	140	Sicilia	300, 600	P	X	0.40	—
Esperia IZX[1]	IZX	270	Servizi Marittimi	300, 600	P G	X	0.40	—
Espero	IIM	—	Navy	—	—	—	—	—
Espero[1]	IUU	—	Ghirardi Genova	—	—	—	—	—
Etna IKG	IKG	—	Navy	—	—	—	—	—
Etna IWJ[1]	IWJ	140	Nav. Generale Italiana	300, 600	P	X	0.40	—
Etruria IKP	IKP	—	Navy	—	—	—	—	—
Etruria INQ[1]	INQ	140	Sicilia	300, 600	P	X	0.40	—
Eugenio Cantoni[1]	IVG	140	Ente Trasporto Cotoni	300, 600	P	X	0.40	—
Euro	IIN	—	Navy	—	—	—	—	—
Europa IEE[1]	IEE	270	La Veloce	300, 600	P G	N	0.40	—
Europa IJI	IJI	—	Navy	—	—	—	—	—
Fagernes[1]	IPQ	190	S. Naz. di Navigazione	300, 600	P	X	0.40	—
Falco	IJT	—	Navy	—	—	—	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
ITALY—*contd.*							Francs.	Francs.	
Favignana [1]	IMV	190	Marrittimi Italiana	300, **600**	P	X	0.40	—	
Febo [1]	IZW	—	Vassallo e Narizzano	300, **600**	P	X	0.40	—	
Fede [1]	IPF	110	Becchi Calgagno	300, **600**	P	X	0.40	—	
Ferdinando Palasciano [1]	IAM	200	Ferrovie dello Stato	300, **600**	P G	N	0.40	—	
Ferencz Ferdinand [1]	IPU	140	Adria Rome	300, **600**	P G	X	0.40	—	
Ferencz Joseph Kiraly [1]	IPT	140	Adria Rome	300, **600**	P G	X	0.40	—	
Ferrara [1]	ILU	200	Ferrovie dello Stato	300, **600**	—	—	0.40	—	
Fert [1]	IYL	190	Alta Italia	300, **600**	P	X	0.40	—	
Fiume [1]	IAJ	190	Nav. Generale Italiana	—	P G	X	0.40	—	
Flavio Gioja	IGE	—	Navy	—	—	—	—	—	
Flegetonte	IFK	—	Navy	—	—	—	—	—	
F. Nullo	IJG	—	Navy	—	—	—	—	—	
Francesca [1]	ITQ	140	Flli Cosulich Trieste	300, **600**	P G	N	0.40	—	
Francesco Ciampa [1]	IWD	110	F. S. Ciampa Piano Sorento	300, **600**	P	X	0.40	—	
Francesco Furruccio [1]	IHZ	—	Navy	—	—	—	—	—	
Fratelli Bandiera [1]	ILX	325	Ferrovie dello Stato	300, **600**	—	—	0.40	—	
F. Stocco	IJU	—	Navy	—	—	—	—	—	
Fuciliere	IIO	—	Navy	—	—	—	—	—	
Fulmine	IIP	—	Navy	—	—	—	—	—	
G. Abba	IJK	—	Navy	—	—	—	—	—	
Gablonz	IWZ	190	Transatlantica Italiana	300, **600**	P G	N	0.40	—	
Garibaldi IUA [1]	IUA	190	Transatlantica Italiana	300, **600**	P G	N	0.40	—	
Garibaldino	IIQ	—	Navy	—	—	—	—	—	
Garigliano	IGH	—	Navy	—	—	—	—	—	
G. Carini	IJW	—	Navy	—	—	—	—	—	
Gerolamo Ullao	IEJ	110	Ferrovi. dello Stato	300, **600**	P	X	0.40	—	
Giannutir	IIF	—	Navy	—	—	—	—	—	
Giglio	IXK	140	Mazza Edoardo	300, **600**	P	X	0.40	—	
Giovanni Bausan	IGD	—	Navy	—	—	—	—	—	
Giovanni C	IWQ	110	Lloyd Mediterraneo	300, **600**	P	X	0.40	—	
Giove	IMG	240	Ferrovi. dello Stato	300, **600**	—	—	0.40	—	
Giuditta [1]	IWS	140	Ravano e Corrado	300, **600**	P G	X	0.40	—	
Giulana	IGN	—	Navy	—	—	—	—	—	
Giulio Cesare IHE	IHE	—	Navy	—	—	—	—	—	
Giulio Cesare IXR [1]	IXR	110	P. Vitulli e Montarull	300, **600**	P G	X	0.40	—	
Giuseppe Beraldo [1]	IXI	—	Flli. Beraldo	—	—	—	—	—	
Giuseppe Verdi [1]	IUV	270	Transatlantica Italiana	300, **600**	P G	N	0.40	—	
Giuseppina Hardi [1]	IOJ	190	Hardi Ernesto et.	300, **600**	P	X	0.40	—	

G. La Masa	IJV	—	Navy	—	—	—	—	—
G. Missori	IJO	—	Navy	—	—	—	—	—
Goffredo Mameli [1]	IUD	110	Ferrovi. dello Stato	300, 600	P	X	0.40	—
Goito	IKU	—	Navy	—	—	—	—	—
Gonzaga [1]	IML	110	Soc. Naz. di Navigazione	300, 600	P	X	0.40	—
G. Pepe	IFB	—	Navy	—	—	—	—	—
Granatiere	IIR	—	Navy	—	—	—	—	—
Graz [1]	IPD	190	Lloyd Triestino	300, 600	P G	X	0.40	—
Helouan [1]	IVY	190	Lloyd Triestino	300, 600	P G	N	0.40	—
Hungaria [1]	IVK	190	Lloyd Triestino	300, 600	P G	X	0.40	—
Iberia [1]	IPC	—	Fed. Cons. Agrari	—	—	—	—	—
Ida IWB [1]	IWB	140	Soc. It. Arm. e Navigazione	300, 600	P	X	0.40	—
Impavido	IIV	—	Navy	—	—	—	—	—
Indiana [1]	IYI	190	Nav. Generale Italiana	300, 600	P G	N	0.40	—
I. Nievo	IJL	—	Navy	—	—	—	—	—
Indomito	IIS	—	Navy	—	—	—	—	—
Innsbruch [1]	IPV	190	Lloyd Triestino	300, 600	P G	X	0.40	—
Insidioso	IIT	—	Navy	—	—	—	—	—
Intrepido	IIU	—	Navy	—	—	—	—	—
Iride	IKT	—	Navy	—	—	—	—	—
Iris [1]	IOZ	140	Edoardo Mazza	300, 600	P	X	0.40	—
Irrequieto	IIX	—	Navy	—	—	—	—	—
Ischia [1]	INZ	190	Marittima Italiana	300, 600	P	X	0.40	—
Italia IHG	IHG	—	Navy	—	—	—	—	—
Italia IZI [1]	IZI	190	Transoceanica Soc. Italiana	300, 600	P G	N	0.40	—
Josto [1]	ITY	140	Sicilia Soc. di Nav.	300, 600	P	X	0.40	—
Juno [1]	IUF	140	Nav. Generale Italiana	300, 600	P	X	0.40	—
Kerka [1]	IVO	190	Soc. Nav. Libera Triestina	300, 600	—	—	0.40	—
Labor [1]	IPL	110	Benedetto Lagorara	300, 600	P	X	0.40	—
Lamia L. [1]	—	—	—	—	—	—	—	—
Lampo IIY	IIY	—	Navy	—	—	—	—	—
Lampo ILL [1]	ILL	190	Columbia Soc.	300, 600	P	X	0.40	—
Lanciere	IIZ	—	Navy	—	—	—	—	—
Laura [1]	ITT	140	Vincenzo de Luca	300, 600	P	X	0.40	—
Legnano [1]	IUL	190	Ferrovi. dello Stato	300, 600	P	X	0.40	—
Leopolis [1]	IXA	140	Lloyd Triestino	300, 600	P G	X	0.40	—
Lepanto [1]	IEX	140	Soc. Venez. di Nav. a Vapore	300, 600	P	X	0.40	—
Lete	IFI	—	Navy	—	—	—	—	—
Libia	IKH	—	Navy	—	—	—	—	—
Liguria	IKQ	—	Navy	—	—	—	—	—
Livietta [1]	IXL	110	Dall'Orso & Co.	300, 600	P	X	0.40	—
Lombadia IKO	IKO	—	Navy	—	—	—	—	—
Loredano [1]	IUX	140	Soc. Ven. di Nav. a Vapore	300, 600	—	—	—	—
Lucania I [1]	IPI	190	Soc. Lucania	300, 600	P	X	0.40	—
Luciano Manara [1]	IEI	110	Ferrovi. dello Stato	300, 600	—	—	0.40	—
Luigino Accame [1]	IVB	140	Soc. Maremola di Nav.	300, 600	P	X	0.40	—
Maddalena [1]	IWK	—	Gaetano Camogli	—	—	—		—
Maiella [1]	ILN	190	Ferrovi. dello Stato	300, 600	P	X	0.40	—
Marco Minghetti [1]	INH	140	Sicilia Soc. di Nav.	300, 600	P	X	0.40	—
Marco Polo	IGY	—	Navy	—	—	—	—	—
Maria C. [1]	IYW	140	Odero Attilio	300, 600	P	X	0.40	—
Marina IVN [1]	IVN	190	Libera Triestina	300, 600	—	—	0.40	—
Marina O. IMO [1]	IMO	110	N. Odero & Co.	300, 600	P	X	0.40	—
Mariquita [1]	IWR	140	Lloyd Mediterraneo	300, 600	P	X	0.40	—
Marsala	IKE	—	Navy	—	—	—	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
ITALY—*contd.*							Francs.	Francs.	
Marsala II [3]	IPS	140	Ferrovi. dello Stato	300, **600**	P	X	0.40	—	
Marte [1]	IVF	140	Soc. Ligure di Armamento	300, **600**	P	X	0.40	—	
Marzocco	ITZ	190	Soc. An. Motovelieri	300, **600**	—	—	0.40	—	
Masaniello [3]	IEW	140	Transoceanica	300, **600**	P	X	0.40	—	
Medici	IKB	—	Navy	—	—	—	—	—	
Melpomene [1]	IVU	—	—	—	—	—	—	—	
Memfi [3]	IPZ	140	Sicilia Soc. di Nav.	300, **600**	P	X	0.40	—	
Merano [3]	IVS	—	—	—	—	—	—	—	
Metlaoni [3]	IYO	—	Devoto Clorialdo	—	—	—	—	—	
Michelangelo [1]	IXM	110	Dall'Orso & Co.	300, **600**	P	X	0.40	—	
Milano [3]	INM	190	Servizi Marittimi	300, **600**	P	X	0.40	—	
Milazzo [1]	IEP	190	Transoceanica	300, **600**	P	X	0.40	—	
Minerva IKX	IKX	—	Navy	—	—	—	—	—	
Minerva IXJ [1]	IXJ	140	Soc. Ligure di Armamento	300, **600**	P	X	0.40	—	
Misurata	IGP	—	Navy	—	—	—	—	—	
Moncalieri [3]	IWW	190	Lloyd Sabaudo	300, **600**	P	X	0.40	—	
Moncenisio ILO [1]	ILO	190	Ferrovi. dello Stato	300, **600**	—	—	0.40	—	
Moncenisio IXT [1]	IXT	110	Alta Italia	300, **600**	P	X	0.40	—	
Monginevro	ITG	110	Alta Italia	300, **600**	P	X	0.40	—	
Montebello	IKZ	—	Navy	—	—	—	—	—	
Monte Bianco [1]	ILD	190	Ferrovi dello Stato	300, **600**	P	X	0.40	—	
Monte Cristo [1]	IVJ	190	Lloyd Sabando	300, **600**	P	X	0.40	—	
Monte Grappa [1]	IBB	140	Cons. Venez. di Arm. e Navigaz.	300, **600**	P	X	0.40	—	
Montello [1]	INA	140	Cons. Venez. di Arm. e Navigaz.	300, **600**	P	X	0.40	—	
Montenegro [3]	IMM	190	Servizi Marittimi	300, **600**	P	X	0.40	—	
Monterosa [1]	ILW	190	Ferrovi dello Stato	300, **600**	P	X	0.40	—	
Monviso ILV [1]	ILV	190	Ferrovi dello Stato	300, **600**	P	X	0.40	—	
Monviso ITH [1]	ITH	110	Alta Italia	300, **600**	P	X	0.40	—	
M. Verderame [1]	IVV	—	—	—	—	—	—	—	
Napoli	IHO	—	Navy	—	—	—	—	—	
Narenta [1]	IVL	190	Libera Triestina	300, **600**	—	—	0.40	—	
Natale L. [1]	IPK	110	Lavarello eredi di G. Lavarello	300, **600**	P	X	0.40	—	
Nazario Sauro [1]	IVE	190	Transatlantica Italiana	300, **600**	P G	N	0.40	—	
Nembo	IJA	—	Navy	—	—	—	—	—	
Nemi [3]	IMW	140	Servizi Marittimi	300, **600**	P	X	0.40	—	
Nettuno [1]	ILE	240	Ferrovi dello Stato	300, **600**	P	X	0.40	—	
N. Fabrizi	IJZ	—	Navy	—	—	—	—	—	
Nibbio	IJR	—	Navy	—	—	—	—	—	
Nicolaos [1]	IYK	140	Soc. Nazionale di Navigaz.	300, **600**	P	X	[illegible]	[illegible]	

Nicolo 2 [1]	IUN	110	N. Odero & Co.	300, 600	P ..	X	0.40	—
Nilos [1]	INB	110	Ferrovi dello Stato	300, 600	P ..	X	0.40	—
Ninfa [1]	ITV	110	Vincenzo De Luca..	300, 600	—	—	0.40	—
Nino Bixio	IKF	—	Navy	—	—	—	—	—
Nitor [1]	ION	—	Flli. Lagorara	—	—	—	—	—
Oceano [1]	IPJ	110	Lloyd Mediterraneo	300, 600	P G ..	X	0.40	—
Oldemburgo [1]	IND	—	Ferrovi dello Stato	—	—	—	—	—
Ombla [1]	IVM	190	Libera Triestina	300, 600	—	—	0.40	—
Onoria [1]	IOV	—	General Steamship agy.	300, 600	P ..	X	0.40	—
Orione 2 [1]	INF	190	Marittima Italiana	300, 600	P ..	X	0.40	—
Orseolo [1]	IYC	140	Soc. Ven. di Nav. a Vapore	300, 600	—	—	0.40	—
Orsini V	IFS	—	Navy	—	—	—	—	—
Ostro	IJB	—	Navy	—	—	—	—	—
Padova [1]	IUT	190	Ferrovi dello Stato	300, 600	P ..	X	0.40	—
Palacky [1]	IXA	140	Lloyd Triestino	300, 600	P G ..	X	0.40	—
Paraguay IMP [1] ..	IMP	140	Sicilia Soc. di Nav.	300, 600	P ..	X	0.40	—
Partenope	IKY	—	Navy	—	—	—	—	—
Patras [1]	IWF	—	Angelo Denegri	300, 600	P ..	X	0.40	—
P. Bronzetti	IJN	—	Navy	—	—	—	—	—
Pegli [1]	IOT	140	Soc. an. Genovese Arm. e Trasp. ..	300, 600	P ..	X	0.40	—
Pesaro [1]	ILM	250	Ferrovi dello Stato	300, 600	P G ..	N	0.40	—
Piave IVX [1]	IVX	190	Soc. Prodotti Ch. Colla e Conc. Roma	300, 600	P ..	X	0.40	—
Piave IEL [1]	IEL	190	Nav. Generale Italiana	300, 600	P ..	X	0.40	—
Piemonte IKJ	IKJ	—	Navy	—	—	—	—	—
Piemonte INX [1] ..	INX	140	Sicilia Soc. di Nav.	300, 600	P ..	X	0.40	—
Pietro Calvi [1]	IWV	140	Ferrovi dello Stato	300, 600	—	—	0.40	—
Pilsna [1]	IAB	140	Lloyd Triestino	300, 600	P G ..	X	0.40	—
Pisa	IHR	—	Navy	—	—	—	—	—
Po [1]	INY	140	Sicilia Soc. di Nav.	300, 600	P ..	X	0.40	—
Pola [1]	INJ	—	Ferrovi dello Stato	300, 600	P ..	X	0.40	—
Polynesia [1]	IXQ	110	Stefano Censini	300, 600	P ..	X	0.40	—
Pontiere	IJC	—	Navy	—	—	—	—	—
Porto di Alessandretta [1]	INT	190	Marittima Italiana	300, 600	P ..	X	0.40	—
Porto di Savona [1] ..	INV	190	Marittima Italiana	300, 600	P ..	X	0.40	—
Posillipo [1]	IEV	190	Transoceanica	300, 600	P ..	X	0.40	—
Praga [1]	IPY	140	Lloyd Triestino	300, 600	P G ..	X	0.40	—
Presidente Wilson [1] ..	IOB	270	Flli. Cosulich	300, 600	P G ..	N	0.40	—
Primula [1]	ILI	190	Bassani Ettore	300, 600	P ..	X	0.40	—
Primula INO [1]	INO	140	Edoardo Mazza	300, 600	P ..	X	0.40	—
Principe di Udine [1] ..	IYU	270	Lloyd Sabaudo	300, 600	P G ..	N	0.40	—
Principessa Jolanda [1] ..	IOG	110	Soc. Ven. di Nav. a Vapore ..	300, 600	P ..	X	0.40	—
Principessa Mafalda [1] ..	IYM	270	Nav. Generale Italiana	300, 600	P G ..	N	0.40	—
Prometeo	IKC	—	Navy	—	—	—	—	—
Procida [1]	IZD	190	Nav. Generale Italiana	300, 600	P ..	X	0.40	—
Puglia	IKK	—	Navy	—	—	—	—	—
Quarto	IKD	—	Navy	—	—	—	—	—
Racconigi [1]	IZJ	110	Lloyd Sabaudo	300, 600	P ..	X	0.40	—
Re d'Italia [1]	IYR	190	Lloyd Sabaudo	300, 600	P G ..	N	0.40	—
Regina d'Italia [1] ..	INI	190	Lloyd Sabaudo	300, 600	P G ..	N	0.40	—
Regina Elena	IHQ	—	Navy	—	—	—	—	—
Resurrezione [1]	IYY	110	La Polare S A.	300, 600	P ..	X	0.40	—
Re Umberto	IHK	—	Navy	—	—	—	—	—
Re Vittorio [1]	IZV	270	Nav. Generale Italiana	300, 600	P G ..	N	0.40	—
Rodi [1]	IXN	190	Sicilia Soc. di Nav.	300, 600	P ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
ITALY—*contd.*									
Rodosto[1]	IYB	140	Soc. Roma di Nav.	300, **600**	P	X	0.40	—	
Roma IHP	IHP	—	Navy	—	—	—	—	—	
Roma INR[1]	INR	190	Soc. Marittima Italiana	300, **600**	P	X	0.40	—	
Roma 2[1]	IYH	190	Sicilia	300, **600**	P	X	0.40	—	
Rosalia[1]	ITE	110	Lloyd Adriatico	300, **600**	P	X	0.40	—	
Rosario[1]	IXX	190	Soc. Roma di Nav.	300, **600**	P	X	0.40	—	
Rosalino Orlando[1]	IAL	190	Lloyd Mediterraneo	300, **600**	P	X	0.40	—	
Rossignano[1]	IZM	140	Soc. Roma di Nav.	300, **600**	P	X	0.40	—	
Rovato[1]	IYJ	190	Soc. Roma di Nav.	300, **600**	P	X	0.40	—	
Roberbella[1]	IZN	190	Soc. Roma di Nav.	300, **600**	P	X	0.40	—	
Roverito[1]	IBG	190	Soc. Roma	300, **600**	P	X	0.40	—	
Rovigno[1]	IOA	190	Soc. Roma	300, **600**	P	X	0.40	—	
R. Pilo	IJJ	—	Navy	—	—	—	—	—	
Salina[1]	IVR	190	Libora Triestina	300, **600**	—	—	0.40	—	
Salvatore[1]	IWA	110	Angelo Gazzolo	300, **600**	P	X	0.40	—	
S. Gennaro[1]	ITF	270	Transoceanica	300, **600**	P G	N	0.40	—	
S. Giorgio IHU	IHU	—	Navy	—	—	—	—	—	
S. Giorgio IMS[1]	IMS	140	Soc. Marittima Italiana	300, **600**	P	X	0.40	—	
S. Giorgio IEA[1]	IEA	190	Transoceanica	300, **600**	P G	N	0.40	—	
S. Giorgio II	IGV	—	Navy	—	—	—	—	—	
S. Giovanni[1]	IEC	190	Transoceanica	300, **600**	P G	N	0.40	—	
S. Giuseppe[1]	IEK	190	Ravano & Carrodo	300, **600**	P	X	0.40	—	
S. Giusto[1]	IPW	190	Ferrovi dello Stato	300, **600**	—	—	0.40	—	
S. Marco	IHT	—	Navy	—	—	—	—	—	
S. Marco	IUB	190	S. A. di Nav. Adriatica	300, **600**	P	X	0.40	—	
S. Rossore[1]	IME	190	Lloyd Sabaudo	300, **600**	P	X	0.40	—	
Sardegna IHM	IHM	—	Navy	—	—	—	—	—	
Sardegna INS[1]	INS	190	Soc. Servizi Marittimi	300, **600**	P	X	0.40	—	
Savoia IEH[1]	IBH	190	La Veloce Soc. di Nav.	300, **600**	P	X	0.40	—	
Savoia 1[1]	IPB	140	Soc. Naz. di Navigazione	300, **600**	P	X	0.40	—	
Savoia 2[1]	IZH	140	Soc. Naz. di Navigazione	300, **600**	P	X	0.40	—	
Scampolo[1]	IVW	140	Lloyd Sabaudo	300, **600**	P	X	0.40	—	
Scillin[1]	IVC	110	Fili. Bianchi	300, **600**	P	X	0.40	—	
Serivia[1]	IMU	190	Marittima Italiana	300, **600**	P	X	0.40	—	
Sebastiano Caboto	IGZ	—	Navy	—	—	—	—	—	
Sestri[1]	IZK	190	Soc. Esercizio Bacini	300, **600**	P	X	0.40	—	
Sicania[1]	IEZ	170	Transoceanica	300, **600**	P	X	0.40	—	
Sicilia IHL	IHL	—	Navy	—	—	—	—	—	
Sicilia INL[1]	INL	190	Soc. It. Serv. Marittimi	300, **600**	P	N	0.40	—	

Silvio Pellico[1]	**IMI**	190	Ferrovi. dello Stato	300, 600	P	X	0.40	—
Sirte[1]	**IZY**	—	Rodinis, G. B. (Livorno)	300, 600	P	X	0.40	—
Sirtori	IJQ	—	Navy	—	—	—	—	—
Sofia Hohemberg[1]	**IPR**	110	Flli. Cosulich	300, 600	—	—	0.40	—
Solunto[1]	**IEU**	140	Sicilia Soc. di Nav.	300, 600	P	X	0.40	—
Sori[1]	**ITN**	190	Alta Italia	300, 600	P	X	0.40	—
Sowwell[1]	**IXC**	—	Corrado Andrea	—	—	—	—	—
Sparviero	IJS	—	Navy	—	—	—	—	—
Speranza[1]	**IWO**	—	Becchi & Calcagno	300, 600	P	X	0.40	—
Splendor[1]	**ILS**	190	Columbia	300, 600	P	X	0.40	—
Sri Samud[1]	**IPN**	190	Ferrovi dello Stato.	300, 600	P	X	0.40	—
S. Schiaffino	IJM	—	Navy	—	—	—	—	—
Sterope	**IGK**	—	Navy	—	—	—	—	—
Stige	IFL	—	Navy	—	—	—	—	—
Strale	**IJD**	—	Navy	—	—	—	—	—
Stromboli[1]	**IWH**	190	Nav. Generale Italiana	300, 600	P	X	0.40	—
Sumatra[1]	**IPB**	190	Soc. Marittima Italiana	300, 600	P	X	0.40	—
Taormina[1]	**IYT**	270	Nav. Generale Italiana	300, 600	P G	N	0.40	—
Tatra ILR[2]	**ILR**	190	Ferrovi. dello Stato	300, 600	P	X	0.40	—
Tebe[1]	IYD	190	Sicilia, Soc. di Nav.	300, 600	P	X	0.40	—
Teresa Accame[1]	IPP	110	Flli. Accame di Luigi	300, 600	P	X	0.40	—
Teresa O[1]	**ITA**	140	Odero & Co.	300, 600	P	X	0.40	—
Tevere	IFO	—	Navy	—	—	—	—	—
Theodo[1]	**INU**	—	Ferrovi. dello Stato	300, 600	—	—	0.40	—
Tirol[1]	**IUP**	140	Lloyd Triestino	300, 600	P G	X	0.40	—
Tirreno[1]	**IMT**	170	Marittima Italiana	300, 600	P	X	0.40	—
Titania IVD[1]	IVD	110	Lloyd Mediterraneo	300, 600	P	X	0.40	—
Titano	IFY	—	Navy	—	—	—	—	—
Tobruk	**IKA**	—	Navy	—	—	—	—	—
Toera[1]	**IYF**	190	Sicilia Soc. di Nav.	300, 600	P	X	0.40	—
Tolemaide[1]	**IMX**	110	Sicilia Soc. di Nav.	300, 600	P	X	0.40	—
Tommaso di Savoia[1]	**IYS**	190	Lloyd Sabaudo	300, 600	P G	N	0.40	—
Tortona[1]	**IUS**	190	Ferrovi. dello Stato	300, 600	—	—	0.40	—
Trasimeno[1]	**IMR**	140	Serv. Marittimi	300, 600	P	X	0.40	—
Tremiti	IFZ	—	Navy	—	—	—	—	—
Trinacria[1]	**IGC**	—	Navy	—	—	—	—	—
Tripoli	**IKV**	—	Navy	—	—	—	—	—
Umbria[1]	**ITU**	190	Soc. It. Serv. Marittimi	300, 600	P	X	0.40	—
Ugo Bassi[1]	**IUW**	190	Ferrovi. dello Stato	300, 600	—	—	0.40	—
Valdarno[1]	**IUE**	190	Lloyd Mediterraneo	300, 600	P	X	0.40	—
Vallarsa[1]	**IUO**	190	Lloyd Mediterraneo	300, 600	P	X	0.40	—
Varese	**IHY**	—	Navy	—	—	—	—	—
Vega[1]	**IMZ**	110	Flli. Lavarello & Censini	300, 600	P	X	0.40	—
Veniero[1]	**IYA**	110	S. Ven. di. Nav. a Vaporo	300, 600	P	X	0.40	—
Vesuvio[1]	**IZQ**	190	Nav. Gen. Italiana	300, 600	P	X	0.40	—
Vettor Pisani	IHF	—	Navy	—	—	—	—	—
Vindobona[1]	**IUJ**	140	Lloyd Triestino	300, 600	P G	X	0.40	—
Virginia IWT[1]	**IWT**	110	Lloyd Mediterraneo	300, 600	P	X	0.40	—
Vittoria IAS[1]	**IAS**	140	Soc. Lucania	300, 600	P	X	0.40	—
Vittorio[1]	**IWY**	110	Vittoria Soc. di. Nav.	300, 600	P	X	0.40	—
Vittorio Emanuele	IHN	—	Navy	—	—	—	—	—
Vittorio Veneto[2]	IUC	190	La Veloce Soc. di Nav.	300, 600	P	X	0.40	—
Volturno[1]	IEQ	190	Transoceanica	300, 600	P	X	0.40	—
Vulcano IGL	IGL	—	Navy	—	—	—	—	—
Vulcano IZO[1]	IZO	190	Nav. Generale Italiana	300, 600	P	X	0.40	—

BB2

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
ITALY—*contd.*									
Wardha [1]	ILQ	140	Corrado Andrea	300, **600**	P	X	0.40	—	
Zeffiro	IJE	—	Navy	—	—	—	—	—	
Zenson	IGU	—	Navy	—	—	—	—	—	
Zovetto [1]	IWK	—	A. Parodi	300, **600**	P	X	0.40	—	
JAPAN									
Aden Maru	JAD	Day 500	Kokusai Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Adzuma	JRD	—	Navy	—	O	—	—	—	
Africa Maru [2]	JDF	Day 400	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Akashi	JLM	—	Navy	—	O	—	—	—	
Aki	JGK	—	Navy	—	O	—	—	—	
Aki Maru [1]	JAI	Day 500 Night 1,500	Nippon Yusen Kaisha	300, **600**	P G	N	0.40	—	
Akita Maru [2]	JCB	Day 400	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Akitsushima	JUQ	—	Navy	—	O	—	—	—	
Alabama Maru [2]	JNF	400	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Alaska Maru [5]	JAL	Day 400	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Alps Maru [5]	JBP	Day 300	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Altai Maru [5]	JFE	Day 300	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Amagisan Maru [5]	JYG	Day 400	Mitoui Bussan Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	

Remarks:

[1] Operated by the Ministry of Communications

[2] Operated and controlled by the owners

[3] Correspondence restricted to radiotelegrams exchanged with Chosen lighthouse and Japanese warships

[4] Cable ships with special service relating to the vessels

[5] Operated by the Kokusai Kisen Kaisha

Amazon Maru[2] ..	JAZ	Day 300	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
America Maru[1] ..	JAC	Day 400 Night 1,000	Osaka Shosen Kaisha	300, 600	P G ..	N	0.40	—
Amur Maru[2]	JAR	Day 300	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Andes Maru[2]	JFU	Day 300	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Annan Maru[2]	JDN	Day 200	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Anyo Maru[1]	JAY	Day 400	Toyo Kisen Kaisha	300, 600	P G ..	N	0.40	—
Arabia Maru[2]	JEG	Day 400	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Argun Maru[2]	JNJ	400	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Arizona Maru	JDZ	Day 400	Osaka Mercantile S.S. Co. ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Asahi	JGB	—	Navy	—	O ..	—	—	—
Asama	JRA	—	Navy	—	O ..	—	—	—
Aso	JRL	—	Navy	—	O ..	—	—	—
Atagosan Maru[2] ..	JYA	Day 400	Mitsui Bussan Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Ataka Maru[2]	JBD	Day 400	Tatsuuma Shokai	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Atlantic Maru[1] ..	JTT	Day 400	Kawasaki Zosenjo	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Atlas Maru	JAP	Day 400	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Atsuta Maru[1]	JAT	Day 450 Night 1,200	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	N	0.40	—
Awa Maru[1]	JAW	Day 400	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Ayaha[2]	JYV	Day 400	Tatsuuma Kisen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Azuma Maru[2]	JBM	Day 400	Tokyo Salvage Co.	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Azumasan Maru[2] ..	JBS	Day 400	Mitsui Bussan Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio telegram.	Remarks.
JAPAN—*contd.*							Francs.	Francs.	
Batavia Maru[1]	JIC	Day 200	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Belgium Maru	JIJ	Day 400	Kawasaki Zosenjo	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Bingo Maru[1]	JBG	Day 300 Night 1,000	Nippon Yusen Kaisha	300, **600**	P G	N	0.40	—	
Bombay Maru[8]	JHU	Day 400	Nippon Yusen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Borneo Maru JCL[8]	JCL	Day 500	Osaka Shosen Kaisha	300, **600**, 1,800	P G	0800 to 1400 1400 to 1700 2000 to 2400	0.40	—	
Borneo Maru JPB[8]	JPB	Day 400	Nanyo Yusen Kaisha	300, **600**, 1,800	P G	N	0.40	—	
Boston Maru[8]	JMC	Day 400	Kokusai Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Burma Maru[8]	JYY	Day 200	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Buyo Maru[5]	JPX	Day 200	Asano Zosenjo	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Calcutta Maru[8]	JBC	Day 400	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Canada Maru[1]	JCD	Day 350 Night 1,200	Osaka Shosen Kaisha	300, **600**	P G	N	0.40	—	
Capetown Maru[8]	JBE	Day 400	Kawasaki Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Caroline Maru[8]	JNR	Day 400	Kokusair Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	

Celebes Maru [1]	JCB	Day 500	Kawasaki Kisen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Ceylon Maru [2]	JDW	Day 400	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Chefoo Maru [2]	JKC	Day 200	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Cheribon Maru ..	JCW	Day 400	Nanyo Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	4.00
Chicago Maru [1]	JCC	Day 350 Night 1,200	Osaka Shosen Kaisha	300, 600	P G ..	N	0.40	—
Chifuku Maru [2] ..	JHZ	Day 500	Kawasaki Zosenjo	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Chihaya..	JWB	—	Navy	—	O ..	—	—	—
Chikuma	JLG	—	Navy	—	O ..		—	—
Chitose	JLB	—	Navy	—	O ..	—	—	—
Chiyoda	JUP	—	Navy	—	O ..	—	—	—
Chosen Maru [2]	JPV	Day 200	Osaka Shosen Kaisha	300, 600, 1,800	P G ..	N	0.40	—
Choyo Maru [2]	JOY	Day 400	Toyo Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Clyde Maru	JCZ	Day 400	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Daibu Maru [2]	JEU	Day 400	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Dakar Maru [1]	JKW	Day 400	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Delagoa Maru [2] ..	JDI	Day 400	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Denmark Maru ..	JDJ	Day 400	Kawasaki Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Durban Maru [2]	JKQ	Day 400	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	—	—
Egypt Maru	JED	Day 400	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Eifuku Maru [2]	JFG	Day 400	Kawasaki Dockyard Co.	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
England Maru.. ..	JAG	Day 400	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Etna Maru	JEN	Day 400	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	4.00

Ship Stations—*Continued*

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JAPAN—*contd.*							Francs.	Francs.	
France Maru	JAJ	Day 400	Kawasaki Zosenjo	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Fuji	JUC	—	Navy	—	O	—	—	—	
Fukui Maru [2]	JYT	Day 200	Uchida Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Fukuyo Maru [3]	JKV	Day 400	Nippon Kaiun Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Fushimi	JWJ	—	Navy	—	O	—	—	—	
Fushimi Maru [1]	JFM	Day 450 Night 1,200	Nippon Yusen Kaisha	300, **600**, 1,800	P G	N	0.40	—	
Fuso	JGN	—	Navy	—	—	—	—	—	
Ganges Maru [3]	JEP	Day 200	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Genchu Maru [3]	JHD	Day 400	Uyenishi Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Genmei Maru [3]	JBN	Day 400	Uyenishi Kisen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Genoa Maru [3]	JSL	Day 400	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Genyei Maru [3]	JIN	Day 200	Uyenishi Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Gozan Maru	JID	Day 400	Kokusai Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Hague Maru	JHX	Day 300	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Hakata Maru [3]	JPK	Day 400	Nippon Yusen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	

Hakodate Maru[2] ..	JMB	Day 400	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Hakushika Maru[2] ..	JBX	Day 400	Tatsuuma Kisen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Hambrug Maru ..	JHR	Day 400	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Hanasaki Maru[2] ..	JCF	Day 200	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Harbin Maru[1] ..	JHB	Day 450 Night 1,200	Osaka Shosen Kaisha	300, 600	P G ..	N	0.40	—
Harima Maru[2] ..	JHH	400	Shinsen Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Haruna	JGX	—	Navy	—	—	—	—	—
Haruna Maru[2]	JPH	Day 200	Tokio Salvage Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Harve Maru	JDL	Day 300	Osaka Shosen Kaisha	300. 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	4.00
Hashidate	JUO	—	Navy	—	O ..	—	—	—
Havana Maru	JHC	Day 300	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Hawaii Maru[1] ..	JHW	Day 450 Night 1,000	Osaka Shosen Kaisha	300, 600, 1,800	P G ..	N	0.40	—
Hayatori Maru[1] ..	JHY	100	Ministry of Agriculture & Commerce	300, 600	P G ..	N	0.40	—
Hayo Maru	JFA	Day 400	Toyo Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Heijin Maru[2]	JIV	Day 400	Taiyo Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Heimei Maru[2] ..	JKP	Day 400	Taiyo Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Heinan Maru[2] ..	JEB	Day 400	Taiyo Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Hidson Maru[2]	JBO	Day 400	Tatsuma Kisen Kab. Kaisha ..	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Hiei	JGV	—	Navy	—	O ..	—	—	—
Himalaya Maru[2] ..	JFN	Day 400	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—

Ship Stations—*Continued*

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							Francs.	Francs.	
JAPAN—*contd.*									
Hirano Maru[1]	JHR	Day 400 Night 1,200	Nippon Yusen Kaisha	300, **600**, 1,800	P G	N	0.40	—	
Hirato	JLJ	—	Navy	—	O	—	—	—	
Hiuga	JGY	—	Navy	—	O	—	—	—	
Hizen	JGD	—	Navy	—	O	—	—	—	
Hofuku Maru[2]	JHM	Day 500	Kawaski Zosenjo	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Hokkai Maru[2]	JYP	Day 400	Meiji Kaiun Kabushaki Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Hokuto Maru	JET	Day 400	Itaya Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Holland Maru	JOR	Day 400	Kawasaki Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Hong Kong Maru[1]	JHN	Day 300 Night 1,000	Osaka Shosen Kaisha	300, **600**	P G	N	0.40	—	
Honolulu Maru[2]	JNE	Day 300	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Horaisan Maru[2]	JBJ	Day 400	Mutsui Bussan Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Hoyeisan Maru	JFQ	Day 400	Mitsui Bussan Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Hozan Maru[2]	JYZ	Day 400	Osaka Shosen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Hudson Maru	JBO	Day 400	Tatsuma Kisen Kabushiki Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Ibuki	JGT	—	Navy	—	O	—	—	—	
Idzumo	JRG	—	Navy	—	O	—	—	—	

Iki Maru [1]	JIL	Day 350 Night 1,000	Imperial Government Railways	300, 600, 1,800	P G ..	N	0.40	—
Ikoma	JGQ	—	Navy	—	O ..	—	—	—
Ikomasan Maru [2] ..	JBV	Day 400	Mitsui Bussan Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Inaba Maru [1]	JIB	Day 450 Night 1,200	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	N	0.40	—
Inaho Maru [2]	JFB	Day 400	Itaya Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Indo Maru [2]	JDS	Day 400	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Indus Maru [2]	JCR	Day 200	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Ise	JGP	—	Navy	—	O ..	—	—	—
Italy Maru [2]	JAH	Day 400	Kawasaki Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Itsukushima	JUN	—	Navy	—	O ..	—	—	—
Iwami	JUD	—	Navy	—	O ..	—	—	—
Iwate	JRF	—	Navy	—	O ..	—	—	—
Iyo Maru [2]	JPO	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	N	0.40	—
Java Maru [1]	JDU	Day 400	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Jinsen Maru [2]	JDZ	Day 400	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Jinsho Maru [2]	JIQ	Day 400	Taiyo Kisen Kaisha .. .	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Jufuku Maru [2]	JIK	500	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Kaga Maru [2]	JPG	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	N	0.40	—
Kagi Maru [1]	JKG	Day 300 Night 1,000	Osaka Shosen Kaisha	300, 600	P G ..	N	0.40	—
Kaian Maru [2]	JIP	Day 400	Katsuta Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Kaifuku Maru [2] ..	JBF	Day 400	Katsuta Kisen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Kaigen Maru [2]	JAQ	Day 150	Mitsui Bussan Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Kaikyu Maru [2] ..	JKK	Day 400	Katsuta Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—

Ship Stations—*Continued*

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JAPAN—*contd.*							Francs.	Francs.	
Kaisho Maru [2]	JEO	Day 400	Katsuta Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kamakura Maru [2]	JPR	Day 400	Nippon Yusen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kamo Maru [1]	JKA	Day 450 Night 1,200	Nippon Yusen Kaisha	300, **600**	P G	N	0.40	—	
Kanagawa Maru [2]	JNA	400	Nippon Yusen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Karachi Maru [2]	JKH	Day 500	Kawasaki Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Karasaki	JUV	—	Navy	—	O	—	—	—	
Kasado Maru [1]	JKT	Day 300 Night 1,000	Osaka Shosen Kaisha	300, **600**	P G	N	0.40	—	
Kashima	JGG	—	Navy	—	O	—	—	—	
Kashima Maru [1]	JKX	Day 450 Night 1,200	Nippon Yusen Kaisha	300, **600**, 1,800	P G	N	0.40	—	
Kashu Maru	JOU	Day 200	Kokusai Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kasuga	JRJ	—	Navy	—	O	—	—	—	
Kasuga Maru [2]	JKO	Day 200	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Katori	JGF	—	Navy	—	O	—	—	—	
Katori Maru [1]	JKR	Day 450 Night 1,200	Nippon Yusen Kaisha	300, **600**, 1,800	P G	N	0.40	—	
Kawachi Maru [2]	JPC	Day 200	Nippon Yusen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 [illegible]	0.40	—	

Keifuku Maru [2]	JHT	Day 400	Kawasaki Zooenjo	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Keishin Maru [3]	JCK	Day 400	Tatsuuma Shokai	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kibi Maru No. 6 [3] ..	JHP	Day 400	Toyosaki Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kifuku Maru [3]	JHK	Day 400	Kawasaki Dockyard Co.	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kimi Maru [2]	JHS	Day 400	Kobe Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kinkasan Maru [3] ..	JYK	Day 400	Mitsui Bussan Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kirin Maru [3]	JDX	Day 200	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kirishima	JGW	—	Navy	—	—	—	—	—	
Kishun Maru [3] ..	JFH	Day 200	Tatsuma Kisen Kabushiki Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kiso Maru	JKJ	Day 400	Tokio Kaiun Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kitano Maru [1]	JKN	Day 450 Night 1,200	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	N	0.40	—	
Kiyo Maru [1]	JKY	Day 250 Night 800	Toyo Kisen Kaisha	300, 600	P G ..	N	0.40	—	
Kleist JOD	JOD	Day 275	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Koan Maru [3]	JFO	Day 400	Katsuda Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kobe Maru [1] ..	JKB	Day 300 Night 1,000	Nippon Yusen Kaisha	300, 600	P G ..	N	0.40	—	
Kochi Maru	JOA	Day 400	Teikoku Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Koei Maru [3] ..	JEK	Day 400	Hiromi Shoji Kaisha	300, 600	P G ..	0800 to 0100 1400 to 1700 2000 to 2400	0.40	—	
Kofuku Maru J	JBQ	Day 400	Hiromi Shoji Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kofuku Maru JFL [3] ..	JFL	Day 500	Kawasaki Dockyard Co. ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	

Ship Stations—*Continued*

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JAPAN—*contd.*							Francs.	Francs.	
Komagata Maru[3]	JDV	Day 200	Yamashita Kamesaburo	300, **600**	P G	0800 to 1700 1400 to 1700 2000 to 2400	0.40	—	
Komahashi	JUU	—	Navy	—	O	—	—	—	
Koma Maru[1]	JKL	Day 400 Night 1,200	Imperial Government Railways	300, **600**, 1,800	P G	N	0.40	—	
Konan Maru[3]	JHA	Day 400	Kobe Sambashi Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kongo	JGU	—	Navy	—	O	—	—	—	
Kongosan Maru[3]	JYQ	Day 400	Mitsui Bussan Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Korea Maru[3]	JYL	Day 500	Toyo Kisen Kaisha	300, **600**, 1,800	P G	N	0.40	—	
Kosai Maru[3]	JKS	Day 120 Night 200	Chosen Government	—	—[3]	N	—	—	
Koshun Maru[3]	JAV	Day 400	Kobe Sambashi Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kotsu Maru[3]	JIG	Day 400	Hiromi Shoji Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Koyo Maru[3]	JKD	Day 400	Toyo Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kuma	JLA	—	Navy	—	O	—	—	—	
Kumano Maru[3]	JKF	Day 200	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kunajiri Maru[3]	JKU	Day 400	Nihon Kaiin Ekisai Kai	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Kurama	JGR	—	Navy	—	O	—	—	—	

Kureha Maru [2]	JBH	Day 400	Tatsuuma Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Kurushima Maru	JMU	Day 400	Teikoku Kaiji Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Lima Maru	JCM	Day 400	Nippon Yusen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Liverpool Maru [2]	JPL	Day 500	Kawasaki Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Luzon Maru [2]	JDQ	Day 200	Osaka Shosen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Lyons Maru	JOM	Day 400	Nippon Yusen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	4.00
Macassar Maru	JNV	Day 400	Nanyo Yusen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Madras Maru [2]	JIR	Day 200	Osaka Shosen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Malacca Maru	JNG	Day 400	Nippon Yusen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Malay Maru [2]	JEM	Day 400	Osaka Shosen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Malta Maru	JMT	Day 200	Kokusai Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Mandasan Maru [2]	JYJ	Day 400	Mitsui Bussan Kaisha	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Manila Maru [1]	JMR	Day 450 Night 1,300	Osaka Shosen Kaisha	300, 600, 1,800	P G	N	0.40	—
Manshu	JUT	—	Navy	—	O	—	—	—
Manshu Maru	JNX	Day 400	Tairen Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Matsuyama Maru	JMW	Day 200	Nippon Yusen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Meichi Maru [2]	JBA	Day 200	Meiji Kaiun Kaisha	300, 600	P	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Meidai Maru [2]	JFD	Day 300	Yamaji Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Meikai Maru [1]	JCA	Day 200	Meiji Kaiun Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—

Ship Stations—*Continued*

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JAPAN—*contd.*							Francs.	Francs.	
Meiko Maru [2]	JDO	Day 400	Meiji Kaiun Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Meiten Maru [2]	JDG	Day 400	Meiji Kaiun Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Meiu Maru [2]	JFV	Day 400	Meiji Kaiun Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Meiyo Maru [2]	JPI	400	Toyo Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Mexico Maru [1]	JMX	Day 350 Night 1,200	Osaka Shosen Kaisha	300, **600**	P G	N	0.40	—	
Miikesan Maru [2]	JBI	Day 400	Mitsui Bussan Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40		
Mikasa	JGC	—	Navy	—	O	—	—	—	
Mishima	JUL	—	Navy	—	O	—	—	—	
Mishima Maru [1]	JMQ	Day 450 Night 1,200	Nippon Yusen Kaisha	300, **600**	P G	N	0.40	—	
Mito Maru	JMV	Day 400	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Mitsuki Maru	JAV	Day 400	Kobe Sambashi Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Miye Maru [2]	JNI	Day 400	Teikoku Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Mogami	JWD	—	Navy	—	O	—	—	—	
Morioka Maru [2]	JOK	400	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Muroran Maru [2]	JAK	Day 400	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	

Musashi	JUY	—	Navy	—	O ..	—	—	—
Nagano Maru [2] ..	JCI	Day 400	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Nagato	JGL	—	Navy	—	O ..	—	—	—
Nagato Maru [1] ..	JBY	Day 400	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Nankai Maru [2] ..	JYF	Day 400	Meiji Kaiun Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Nanking Maru [2] ..	JCG	Day 200	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Neisei Maru [2]	JND	Day 400	Harada Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Niitaka	JLN	—	Navy	—	O ..	—	—	—
Nikko Maru [1]	JNL	Day 450 Night 1,200	Nippon Yousen Kaisha	300, 600, 1,800	P G ..	N	0.40	—
Nishiyama Maru ..	JNZ	Day 400	Tokizaki Hachiro	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Nisshin	JRK	—	Navy	—	O ..	—	—	—
Norway Maru [2] ..	JNW	Day 400	Kawasaki Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Ogasawarra Maru [2] ..	JOG	Day 300 Night 800	Ministry of Communications ..	300, 600	— [4]	—	—	—
Okinawa Maru [2] ..	JON	Day 350 Night 1,000	Ministry of Communications ..	300, 600	— [4]	—	—	—
Okinoshima	JUK	—	Navy	—	O ..	—	—	—
Oridono Maru [2] ..	JCO	Day 400	Tatsuuma Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Otaru Maru No. 2 [2] ..	JEH	Day 400	Yamashita Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Otori Maru [2]	JOT	Day 300	Roryo Suisan Kumiai	300, 600	P G ..	X	0.40	—
Oura Maru [2]	JYC	Day 300	Nippon Kaiji Kogyo Kaisha ..	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Panama Maru [1] ..	JPM	Day 350 Night 1,200	Osaka Shosen Kaisha	300, 600	P G ..	N	0.40	—
Peking Maru [2]	JFP	Day 200	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Penang Maru [2] ..	JDR	Day 200	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—

Ship Stations—*Continued*

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JAPAN—*contd.*							Francs.	Francs.	
Persia Maru [2]	JPP	Day 400	Toyo Kisen Kaisha	300, **600**, 1,800	P G	N	0.40	—	
Portland Maru	JIT	Day 500	Kokusai Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Portsaid Maru [2]	JPN	Day 500	Kawasaki Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Raifuku Maru [2]	JHL	Day 400	Kawasaki Zosenjo	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Rangoon Maru [2]	JDY	Day 200	Nippon Yusen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Rashu Maru [1]	JER	Day 400	Imperial Government Railways	300, **600**	P G	N	0.40	—	
Reiyo Maru	JOO	Day 400	Toyo Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Riojun Maru [2]	JYR	Day 400	Nanyo Yusen Kaisha	300, **600**, 1,800	P G	N	0.40	—	
Rozan Maru [5]	JOZ	Day 200	Hashimoto Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Sado Maru [1]	JSD	Day 300 Night 1,000	Nippon Yusen Kaisha	300, **600**	P G	N	0.40	—	
Saga JWL	JWL	—	Navy	—	O	—	—	—	
Saigon Maru [2]	JEV	Day 200	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Saikai Maru [2]	JEZ	Day 400	Katsuda Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Sakaki Maru [1]	JKI	Day 400 Night 1,200	S. Manchurian Rly. Co.	300, **600**	P G	N	0.40	—	
Sakigake Maru No. 3 [2]	JBK	Day 100	Nippon Kaijo Kogyo Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	

Samarang Maru ..	.. JSO	Day 400	Nanyo Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Sanuki Maru [2] ..	.. JPS	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Satsuma JGJ ..	.. JGJ	—	Navy	—	O ..	—	—	—	
Scotland Maru	.. JSJ	Day 400	Kawasaki Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Seattle Maru [1] ..	.. JST	Day 350 Night 1,200	Osaka Shosen Kaisha	300, 600	P G ..	N	0.40	—	
Seifuku Maru ..	.. JDM	Day 500	Kawasaki Zosenjo	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Seiyo Maru [1] ..	.. JSY	Day 400	Toyo Kisen Kaisha	300, 600	P G .	N	0.40	—	
Sekko Maru ..	.. JOJ	Day 200	Osaka Shosen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Settsu	.. JGM	—	Navy	—	O ..	—	—	—	
Shanghai Maru	.. JNM	Day 100	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Shidzuoka Maru [1]	.. JSZ	Day 350 night 1,200	Nippon Yusen Kaisha	300, 600	P G ..	N	0.40	—	
Shikishima ..	.. JGA	—	Navy	—	O ..	—	—	—	
Shinano Maru [1]	.. JSN	Day 350 Night 1,200	Nippon Yusen Kaisha	300, 600	P G ..	N	0.40	—	
Shinbu Maru [2] ..	.. JBB	Day 400	Katsuda Kisen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Shinkoku Maru [2]	.. JCV	Day 500	Kishimoto Kisen Kaisha ..	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Shinpo Maru [2] ..	.. JDH	Day 400	Kishimoto Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Shinsei Maru [2] ..	.. JEF	Day 200	Kishimoto Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Shinyo Maru JSH [1]	.. JSH	Day 450 Night 1,500	Toyo Kisen Kaisha	300, 600	P G ..	N	0.40	—	
Shinyo Maru JPY [2]	.. JPY	Day 200	Kishimoto Kisen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Shiragi Maru [1] ..	.. JSK	Day 350 Night 1,000	Imperial Government Railways ..	300, 600, 1,800	P G ..	N	0.40	—	
Shunko Maru [2] ..	.. JSQ	Day 400	Goko Shokai	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	

Ship Stations—*Continued*

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JAPAN—*contd.*							Francs.	Francs.	
Siam Maru [2]	JYX	Day 200	Osaka Shosen Kaisha	300, **600**, 1,800	P G	N	0.40	—	
Siberia Maru [2]	JBR	Day 500 Night 1,500	Toyo Kisen Kaisha	300, **600**, 1,80ↄ	P G	N	0.40	—	
Singapore Maru [2]	JSP	Day 500	Kawasaki Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Somedono Maru [2]	JYN	Day 400	Tatsuuma Kisen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Spain Maru	JSE	Day 400	Kawasaki Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Suki Maru [2]	JDP	Day 300	Tatsuuma Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Suma	JLL	—	Navy	—	O	—	—	—	
Sumatra Maru [2]	JCU	Day 500	Osaka Shosen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Sumida	JWG	—	Navy	—	O	—	—	—	
Surabaya Maru	JHQ	Day 200	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Suwa Maru [1]	JSU	Day 450 Night 1,200	Nippon Yusen Kaisha	300, **600**, 1,800	P G	N	0.40	—	
Suwo	JUG	—	Navy	—	O	—	—	—	
Sweden Maru	JSF	Day 500	Kawasaki Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Sydney Maru	JNP	Day 400	Kokusai Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Tacoma Maru [1]	JTA	Day 350 Night 1,200	Osaka Shosen Kaisha	300, **600**	P G	N	0.40	—	

Taiahu Maru[1]	JTC	Day 300 Night 1,000	Osaka Shosen Kaisha	300, 600	P G ..	N	0.40	—
Taiho Maru[2]	JHV	Day 400	Uchida Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Taikai Maru JEB[2] ..	JEB	Day 400	Taiwan Seito Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Taikwa Maru	JTK	Day 200	Yamashita Kisen Kabushiki Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tainan Maru[1]	JTN	Day 300 Night 1,000	Osaka Shosen Kaisha	300, 600	P G ..	N	0.40	—
Taisan Maru[2]	JFW	Day 400	Hashimoto Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Taisei Maru[1] ..	JTM	Day 300 Night 1,000	Mercantile Marine School ..	300, 600	P G ..	N	0.40	—
Taito Maru[2]	JFT	Day 400	Uchida Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Taiyu Maru[2]	JCW	Day 400	Uchida Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tajima Maru[2] ..	JPJ	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Takaska Maru ..	JNK	Day 400	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	—	—
Taketoyo Maru[2] ..	JTU	400	Nippon Yusen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tama Maru[2]	JFI	Day 400	Tokio Kaiun Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tamatsu Maru[2] ..	JTP	Day 400	Yamashita Kisen Kaisha ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tamba Maru[1]	JTB	Day 300 Night 1,000	Nippon Yusen Kaisha	300, 600	P G ..	N	0.40	—
Tango Maru[1]	JTG	Day 450 Night 1,200	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	N	0.40	—
Tatsuno Maru[2] ..	JPU	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tatsuta	JLQ	—	Navy	—	O ..	—	—	—
Tencho Maru[2] ..	JHG	Day 150	Tatsuma Kisen Kabushiki Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 t 2400	0.40	—

Ship Stations—*Continued*

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JAPAN—*contd.*							Francs.	Francs.	
Tenkai Maru [3]	JCN	Day 400	Koyanagi Shichishiro	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Tenpaisan Maru [3]	JPZ	Day 400	Mitsui Bussan Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Tenryu	JLP	—	Navy	—	O	—	—	—	
Tensho Maru [2]	JCH	Day 400	Oguna Koichiro	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Tenyo Maru [1]	JTY	Day 450 Night 1,500	Toyo Kisen Kaisha	300, **600**	P G	N	0.40	—	
Texas Maru	JTD	Day 400	Teikoku Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Thames Maru [2]	JTE	Day 400	Kawasaki Zosenjo	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Toba JWK	JWK	—	Navy	—	O	—	—	—	
Toba Maru [3]	JPF	Day 400	Nippon Yusen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Tofuku Maru	JDD	500	Kokusai Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Tokiwa	JRB	—	Navy	—	O	—	—	—	
Tokiwa Maru [2]	JYW	Day 400	Nippon Yusen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Tokushima Maru [3]	JTQ	Day 400	Nippon Yusen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Tokuyama Maru	JTU	Day 400	Nippon Yusen Kaisha	300, **600**, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Tomiura Maru	JFS	Day 400	Mitsubishi Shoji Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	

Tone	JLF	—	Navy	—	O	—	—	—
Tone Maru [2]	JTF	Day 400	Tokio Kaium Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tosa Maru [2]	JBT	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tosan Maru [2]	JFZ	Day 400	Katsuta Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tottori Maru [2]	JPQ	Day 400	Nippon Yusen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Toyama Maru [2]	JTX	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Toyen Maru	JOV	Day 200	Osaka Shosen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Toyohashi Maru [2]	JPT	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Toyooka Maru [2]	JYO	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tsugaru	JLC	—	Navy	—	O	—	—	—
Tsuruga Maru [2]	JPA	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tsurugisan Maru [2]	JBL	Day 400	Mitsui Bussan Kaisha	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tsurushima Maru [2]	JTV	Day 400	Uwajima Unyu Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tsushima	JLO	—	Navy	—	O	—	—	—
Tsushima Maru JMA [2]	JMA	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tsushima Maru JTL [1]	JTL	Day 350 Night 1,000	Imperial Government Railways	300, 600, 1,800	P G	N	0.40	—
Tsuyama Maru [2]	JYM	Day 400	Nippon Yusen Kaisha	300, 600, 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Tyne Maru [1]	JTI	Day 400	Kawasaki Zosenjo	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Uji	JWF	—	Navy	—	O	—	—	—
Ume Maru [2]	JEW	Day 400	Taiyo Kaiun Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—
Urarusan Maru	JMS	Day 400	Yamaichi Kisen Kaisha	300, 600	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
JAPAN—*contd.*							Francs.	Francs.	
Vancouver Maru	JIZ	Day 500	Kawasaki Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Victoria Maru	JIS	Day 400	Kawasaki Josenjo	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Wakamiya	JUR	—	Navy	—	—	—	—	—	
Wakasa Maru [3]	JPW	Day 400	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yahagi	JLK	—	Navy	—	O	—	—	—	
Yakumo	JRC	—	Navy	—	O	—	—	—	
Yakumo Maru [3]	JYS	Day 400	Osaka Shosen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yamagata Maru [3]	JCP	Day 400	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yamashiro	JGO	—	Navy	—	O	—	—	—	
Yamato	JUX	—	Navy	—	O	—	—	—	
Yawata Maru [3]	JYD	200	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yaye Maru [3]	JAE	Day 400	Kokusai Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yayoi Maru [3, 4]	JYI	Day 400	Kokusai Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yeboshi Maru [3]	JHO	Day 400	Nippon Yusen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yehime Maru	JAX	Day 400	Yamashita Kisen Kaisha	300, **600** 1,800	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yeitai Maru [3]	JCT	Day 400	Katsuda Kisen Kaisha	300, **600**	P G	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	

Yepres Maru	JHI	400	Teikoko Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yesaki Maru [2]	JEQ	Day 400	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yodo	JWC	—	Navy	—	O ..	—	—	—	
Yoko Maru [2]	JAB	Day 400	Taiyo Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yokohama Maru [1] ..	JYH	Day 350 Night 1,200	Nippon Yusen Kaisha	300, 600	P G ..	N	0.40	—	
Yomei Maru [2]	JIX	Day 400	Taiyo Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yonan Maru [2]	JNC	Day 400	Taiyo Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yone Maru [2]	JIW	Day 400	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yoshida Maru No. 1 [2] ..	JIH	Day 200	Yamashita Kisen Kaisha.. ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yoshida Maru No. 3 [2] ..	JCY	Day 400	Yamashita Kisen Kaisha.. ..	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yubae Maru [2]	JYE	Day 400	Kokusai Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yubari Maru	JBU	Day 400	Hokkuido Tanko	300, 600, 1,800	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yuki Maru [2]	JDC	Day 300	Tatsuuma Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
Yuri Maru [2]	JAF	Day 400	Teikoku Kisen Kaisha	300, 600	P G ..	0800 to 1100 1400 to 1700 2000 to 2400	0.40	—	
MAURITIUS									
Labourdonnais [1] ..	VRK	100	Government of Mauritius ..	300, 600	O ..	X	—	—	[1] Operated by owners.
MEXICO									
Coahuila [2]	XBL	—	Comp. de Fomento del Sur. de Mexico	—	P G ..	—	0.40	—	[1] Operated and controlled by the Marconi International Marine Com. Co., Ltd., London [2] Operated and controlled by the Radio Corpn. of America
General Zaragoza ..	XCA	—	Navy	600	O ..	0200 to 0600 1800 to 2200	—	—	
Jalisco [2]	XBK	—	Comp. de Fomento del Sur. de Mexico	—	P G ..	—	0.40	—	
Korrigan III [2]	XBF	200	Cia del Boleo	300, 600	P G ..	X	0.40	—	

Ship Stations—*Continued*

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MEXICO—*contd.*							Francs.	Francs.	
Mazatláu [2]	XBH	200	Lloyd Mexicano	300, **600**	P G	X	0.40	—	
Mexico XBB	XBB	120	Comp. Mexicana de Nav.	300, **600**	P G	X	0.40	—	
Progreso	XCF	400	Government	600	P G	N	0.40	4.00	
San Antonio XBE [1]	XBE	130	Cia. Mexicana de Vap. "San Antonio"	300, **600**	P G	X	0.40	—	
San Bernardo [1]	XBA	170	Cia. Mexicana de Petroleo "El Aguila."	300, **600**	P G	X	0.40	—	
San Cristobal [1]	XBI	—	Cia. Mexicana de Petroleo "El Aguila."	—	P G	—	0.40	—	
MONACO									
Hirondelle	CQA	380	Prince of Monaco	600	P	X	—	—	
MOROCCO									
Faci	CNJ	120	Customs Administration	300	O	N	—	—	
Marrakchi	CNM	120	Customs Administration	300	O	N	—	—	
Meknassi	CNK	120	Customs Administration	300	O	N	—	—	
Taraudant	CNT	120	Customs Administration	300	O	N	—	—	
NATAL									
Assouan	—	—	Assouan S.S. Co., Ltd.	—	—	—	—	—	
NETHERLANDS (See **HOLLAND**)									
NEWFOUNDLAND									
Diana [1]	VOQ	150	Job Bros. Co.	300, **600**	P G	X	0.40	4.00	[1] Operated by the Marconi Wireless Telegraph Co., of Canada, Ltd., Montreal
Eagle VOU [1]	VOU	150	—	300, **600**	P G	X	0.40	4.00	[2] Station is open only during season of navigation (March and April)
Glencoe	VOL	—	—	—	—	—	—	—	
Kyle [1]	VOR	150	—	300, **600**, 800	P G	X	0.40	4.00	

Meigle [1]	VYT	—	Bowring Bros.	—	—	—	—	—
Neptune VOX [1] ..	VOX	150	Job Bros. & Co., Ltd.	300, 600, 800	P G ..	X	0.40	—
Portia [1]	VON	—	—	300, 600, 800	—	—	—	—
Prospero [1]	VOM	—	Bowring Bros.	300, 600, 800	—	—	—	—
Ranger [1]	VOK	150	Bowring Bros.	300, 600, 800	—	—	—	—
Sagona [1]	VYD	150	Reid Nfld. Co.	300, 600, 800	—	—	—	—
Seal VYE	VYE	—	—	300, 600, 800	—	—	—	—
Terra Nova [1]	VYB	—	Bowring Bros., Ltd.	300, 600, 800	—	—	—	—
Thetis [1]	VYW	—	Job Bros. & Co., Ltd.	300, 600, 800	—	—	—	—
Viking [1]	VYC	—	Bowring Bros.	300, 600, 800	—	—	—	—

NEW ZEALAND

Arahura [1]	VMA	Day 150	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Kaiapoi [1]	VLH	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Kaitangata [1]	VLI	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Kaituna [1]	VLT	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Kanna [1]	VLQ	150	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Karori [1]	VMB	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Katoa [1]	VMN	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Kauri [1]	VMC	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Koromiko [1]	VMD	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Mapourika [1]	VLS	150	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Mararoa [1]	VMZ	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Monowai [1]	VMM	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Paloona [1]	VLY	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Rakanoa [1]	VME	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Rotomahana [1]	VMX	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Tarawera [1]	VMF	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Terawhiti	VMH	60	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P R [2] ..	X	0.20	—
Tutanekai [1]	VLX	325	Government	300, 600	O ..	X	—	—
Waipori [1]	VMO	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Wanaka [1]	VMP	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Whangape [1]	VML	200	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—

[1] Operated and controlled by Amalgamated Wireless (Australasia) Ltd.
[2] Special correspondence in connection with the service of the ship
[3] When trading exclusively between the Commonwealth of Australia and New Zealand
[4] When trading exclusively between Wellington and Lyttleton

NORWAY

1	LAU	—	Navy	—	O ..	—	—	—
A.2	LAV	—	Navy	—	O ..	—	—	—
A.3	LAW	—	Navy	—	O ..	—	—	—
A.4	LAX	—	Navy	—	O ..	—	—	—
A.5	LAY	—	Navy	—	O ..	—	—	—
Aagot [3]	TTL	200-250	S. M. Kuhnle & Son, Bergen ..	300, 600	P G ..	X	0.40	4.00
Aalesund [3]	ATT	300	Det. Norske Damptrawlerselskap	300, 600	P G ..	X	0.40	4.00
Aarstad [3]	TTC	100-150	Overretssakförer Sam Mayer, Skibsrederi, Tönsberg	300, 600	P G ..	X	0.40	4.00
Ada TTD [3]	TTD	125	K. Salvesen, Kragerö	300, 450, 600	P G ..	X	0.40	—
Adour [3]	TQL	300	K. Salvesen	300, 450, 600	P G ..	X	0.40	4.00
Æger	LBA	—	Navy	—	O ..	—	—	—
Aladdin [3]	ATS	300	Farsjö & Co., Christiania	300, 600	P G ..	X	0.40	4.00
Alaska LWO [3] ..	LWO	200-250	Knut Kutesnn O.A.S. ..	300, 450, 600	P G ..	X	0.40	4.00
Albatross TZZ [3] ..	TTZ	161	Björnstad & Braekhus ..	300, 600	P G ..	X	0.40	4.00

[1] Operated and controlled by the Norsk Marconikompani
[2] Operated and controlled by the owners
[3] Operated and controlled by the Radio Corpn. of America on behalf of the Norsk Marconikompani

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
NORWAY—*contd.*									
Alexander Kielland [2]	TRM	300	Olaf Orvig, Bergen	300, **600**	P G	X	0.40	4.00	
Alf [2]	AUD	150-175	A/S Jacob R. Olsen, Bergen	300, **600**	P G	X	0.40	4.00	
Alfred Nobel [2]	TQD	150-200	Bernh. Hanssen	300, **600**	P	X	0.40	4.00	
Alm [2]	ATM	200	Skibsaktieselskapet Loddings Rederi	300, **600**	P G	X	0.40	4.00	
Alstad [2]	LWU	400	Bernh. Hanssen	300, 450, **600**	P G	X	0.40	4.00	
America ATE [2]	ATE	175-200	Wilh. Wilhelmsen, Christiania	300, **600**	P G	X	0.40	4.00	
Anders [2]	TPJ	150-175	N. Rögenaes	300, **600**	P G	X	0.40	4.00	
Anna TTA [2]	TTA	100-150	Overretssakförer Sam Meyer, Skibsrederi, Tönsberg	300, **600**	P G	X	0.40	4.00	
Arly [2]	LFZ	150-200	R. Ouergaard & Co.	300, **600**	P G	X	0.40	4.00	
Asator [2]	TQJ	100-150	K. M. Pedersen	300, **600**	P G	X	0.40	4.00	
Asborg [2]	AUY	300	K. M. Pedersen	300, **600**	P G	X	0.40	4.00	
Askeladden [2]	AQF	200-250	J. T. Farsjö & Co., Christiania	300, **600**	P G	X	0.40	4.00	
Aslaug Haaland [2]	AQZ	150-200	John K. Haaland, Haugesund	300, **600**	P G	X	0.40	4.00	
Asturias ATK [2]	ATK	300-480	Fearnley & Eger, Christiania	300, **600**	P G	X	0.40	4.00	
Atlantis [2]	LWX	150-200	Aktieselskapet Atlantis	300, **600**	P G	X	0.40	4.00	
Atle Jarl [2]	LEY	100-150	Det Nordenfjeldske Dampskibsselskab	300, **600**	P G	X	0.20	2.00	
Atna [2]	LFC	150-250	Den Norske Afrika- og Aust.	300, **600**	P G	X	0.40	4.00	
August [2]	LHW	300	Jacob Christensen	300, **600**	P G	X	0.40	4.00	
Augvald [2]	TSG	100-150	A/S. Dampskibsselskapet Augvald	300, **600**	P G	X	0.40	4.00	
Avona [2]	ARK	300	J. A. Jespersen, Tonsberg	300, **600**	P G	X	0.40	4.00	
Aztec AUO	AUO	150	Christian Haaland	300, 450, **600**	P G	X	0.40	4.00	
Baja California [2]	LHC	300	A. O. Lindvig	300, **600**	P G	X	0.20	2.00	
Balto [2]	LHI	100-150	B. Stolt Nielsen	300, **600**	P G	X	0.40	4.00	
Basis [2]	AUF	150-175	Chr. Haaland, Haugesund	300, **600**	P G	X	0.40	4.00	
Bayard [2]	LER	150-200	Akties. Bonheur (F. Olsen)	300, **600**	P G	X	0.40	4.00	
Belfri [2]	ASJ	150-175	Christen Smith, Christiania	300, **600**	P G	X	0.40	4.00	
Belgot [2]	LCL	100-125	Christen Smith	300, **600**	P G	X	0.40	4.00	
Belridge [2]	LBF	100-150	Akties. Tankfart	300, **600**	P G	X	0.40	4.00	
Bergensfjord [1]	LFB	200	Den Norske Amerikalinje, Kr.	300, 450, **600**	P G	N	0.40	4.00	
Bergsdalen [2]	ASD	300	T. L. Ravn, Bergen	300, **600**	P G	X	0.40	4.00	
Bertha [2]	TPK	125	Skibsaktieselskapet Loddings Rederi 3, Christiania	300, 450, **600**	P G	X	0.40	4.00	
Bessa [2]	LGT	200-250	Den Norske Afrika- og, Austr.	300, **600**	P G	X	0.40	4.00	
Besseggen [2]	LCT	400	Jens Folkman	300, 450, **600**	P G	X	0.40	4.00	
Bessheim [2]	LDA	160	A/S Ganger Rolf (F. Olsen)	300, 450, **600**	P G	N	0.28	2.80	
Birk [2]	LDD	150-200	A/S Red. Odfjell	300, **600**	P G	X	0.40	4.00	

Bjonongen [1]	LHK	250	Olav Haabeth	300, 450, **600**	P G	..	X	0.40	4.00
Bjorkelund [1]	AUP	200	S. Ugelstad & Co., Brevik.. ..	300, **600**	P G	..	X	0.40	4.00
Bjornefjord [2]	ARQ	300	Joh. Ludw. Mowinckel, Bergen..	300, **600**	P G	..	X	0.40	4.00
Björnstjerne Bjornson [2]	LHU	200-250	Olaf Örvig	300, 450, **600**	P G	..	X	0.40	4.00
Bogstad [2]	TTQ	150-200	Fearnley and Eger	300, **600**	P G	..	X	0.40	4.00
Bolette [2]	ASP	100-125	Fred Olsen & Co., Christiania ..	300, **600**	P G	..	X	0.40	4.00
Boliviana [2]	LWX	150-200	Bernh. Hanssen	300, **600**	P G	..	X	0.40	4.00
Bombay [2]	LWF	125-150	Aktieselskapet Örnen	300, 450, **600**	P G	..	X	0.40	4.00
Bonna [2]	LFX	150-200	Den Norske Afrika- og Austral. ..	300, **600**	P G	..	X	0.40	4.00
Borgestad [2]	LDZ	150	A/S Borgestad (G. Knudsen) ..	300, **600**	P G	..	X	0.40	4.00
Borghild [2]	ARA	150-175	Torp et Wiese	300, **600**	P G	..	X	0.40	4.00
Borgland [2]	LGW	150-200	Fred Olsen & Co.	300, **600**	P G	..	X	0.40	4.00
Bra-Kar [2]	TSY	150-200	Fred Olsen & Co...	300, **600**	P G	..	X	0.40	4.00
Bratland [2]	TRJ	76-100	A/S Borgestad	300, **600**	P G	..	X	0.40	4.00
Bratsberg [2]	TTV	161-323	A/S Borgestad (G. Knudsen) ..	300, **600**	P G	..	X	0.40	4.00
Bravore [1]	LWZ	1[illegible]0-200	Lundegaard & Stray	300, **600**	P G	..	X	0.40	4.00
Brazil LEQ [2]	LEQ	150-200	A/S Ganger Rolf (F. Olsen) ..	300, **600**	P G	..	X	0.40	4.00
Breifond [2]	LGX	200-250	Sigval Bergesen	300, **600**	P G	..	X	0.40	4.00
Bretagne ASN [2] ..	ASN	100-125	Fred Olsen & Co...	300, **600**	P G	..	X	0.40	4.00
Bueland [2]	ARU	300	Nieuwejaar & Hansen, Bergen ..	300, **600**	P G	..	X	0.40	4.00
Bur [2]	TQB	150-200	A/S Jacob R. Olsen	300, **600**	P G	..	X	0.40	4.00
Bygdonaes	AVB	100-125	H. J. Hansen	300, **600**	P G	..	X	0.40	4.00
Caballero [2]	ARY	300	Bruun & v.d. Lippe, Tönsberg ..	300, **600**	P G	..	X	0.40	4.00
Camilla Gilbert [2] ..	LCJ	150-200	Willy C. Gilbert	300, **600**	P G	..	X	0.40	4.00
Capto [1]	LGL	100-150	B. Stolt Nielsen, Haugesund ..	300, **600**	P G	..	X	0.40	4.00
Carmen ARX [2] ..	ARX	200	T. Lodding, Christiania	300, **600**	P G	..	X	0.40	4.00
Cederic [2]	TSI	150	A/S Det Selmerske Rederi ..	300, 450, **600**	P G	..	X	0.40	4.00
Christian Börs [2] ..	LDU	250	Vilhelm Torkildsen, Bergen ..	300, 450, **600**	P G	..	X	0.40	4.00
Christian Krogh [2] ..	TQN	200	Olaf Orvig	300, 450, **600**	P G	..	X	0.40	4.00
Christian Michelsen [2] ..	ATW	600	Bergh & Helland, Bergen ..	300, **600**	P G	..	X	0.40	4.00
Cissy [2]	TRT	400	Thorp & Wiese	300, **600**	P G	..	X	0.40	4.00
Cleveland ARV [2] ..	ARV	300	Nieuwejaar & Hansen	300, **600**	P G	..	X	0.40	4.00
Cometa [2]	LDS	125	Det Bergenske Dampskibsselskab	300, **600**	P G	..	X	0.20	2.00
Condor AUC [2] ..	AUC	100-150	Bjornstad & Braekhus	300, **600**	P G	..	X	0.40	4.00
Conrad Mohr [2].. ..	TSX	400	A/S Chr. Michelsen	300, 450, **600**	P G	..	X	0.40	4.00
Corona TQF [2]	TQF	100-150	H. M. Wrangell & Co.	300, **600**	P G	..	X	0.40	4.00
Cubano [2]	ATD	175-200	Wilh. Wilhelmsen..	300, **600**	P G	..	X	0.40	4.00
Dageid [2]	TTE	100-150	John P. Pedersen & Son.. ..	300, **600**	P G	..	X	0.40	4.00
Dampen [2]	AVL	125	Rederiaktieselskapet Damp. ..	300, 450, **600**	P G	..	X	0.40	4.00
Dampto [2]	AVM	125	Rederiaktieselskapet Damp. ..	300, 450, **600**	P G	..	X	0.40	4.00
Delaware TPE [2] ..	TPE	150-400	Wilh. Wilhemsen	300, **600**	P G	..	X	0.40	4.00
Delfinus [2]	LHM	—	Det Bergenske Dampskibsselskab	300, **600**	P G	..	X	0.20	2.00
Dicto [1]	LGZ	100-150	B. Stolt Nielsen, Haugesund ..	300, **600**	P G	..	X	0.40	4.00
Drammensfjord [2] ..	LFL	100-150	Den Norske Amerika-Linje ..	300, **600**	P G	..	X	0.40	4.00
Draug	LAI	—	Navy	—	O	..	—	—	—
Duro [2]	AQU	200	J. W. Prebensen, Risör	300, **600**	P G	..	X	0.40	4.00
Edith Fische [2] ..	AUN	150-175	Magnus Fische, Bodo	300, **600**	P G	..	X	0.40	4.00
Eidsvold	LAA	—	Navy	—	O	..	—	—	—
Einar Jarl [2]	ARS	200-250	Det Nordenfjeldske Dampskibs-selskab	300, **600**	P G	..	X	0.40	4.00
Ek [2]	ASO	100-125	Fred Olsen & Co...	300, **600**	P G	..	X	0.40	4.00
Eldrid [2]..	AUI	200	Bachke & Co., Trondhjem ..	300, **600**	P G	..	X	0.40	4.00
Elida Clausen [2] ..	LCN	100-125	M. Clausen	300, **600**	P G	..	X	0.40	4.00
Ellen Stub [2]	ARI	150-175	Kjeld Stub, Christiania	300, **600**	P G	..	X	0.40	4.00
Ellida	LAG	—	Navy	—	O	..	—	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
NORWAY—*contd.*							Francs.	Francs.	
Ellis LDX [2]	LDX	350	O. & A. Irgens	300, **600**	P G ..	X	0 40	4 00	
Erle [2]	LCC	150-200	Arentz & Halvorsen	300, **600**	P G ..	X	0.40	4.00	
Erviken [2]	AUX	200-250	Haakon J. Wallem	300, **600**	P G ..	X	0.40	4.00	
Estrella [2]	TPL	350-700	Det Bergenske Dampskibsselskab	300, 450, **600**, 1,800	P G ..	X	0.40	4.00	
Evanger [2]	TQY	100-150	Westfal Larsen & Co., A/S ..	300, **600**	P G ..	X	0.40	4.00	
Fageraas [2]	TSU	100-150	Johan Erland	300, **600**	P G ..	X	0.40	4.00	
Falk [4]	ATC	400	Chr. Christensen jr., Sandefjord..	300, **600**	P G ..	X	0.40	4.00	
Farm	**LAH**	—	Navy	—	O ..	—	—	—	
Felix TRZ [2]	TRZ	100-150	Dampskibsaktieselskapet Storborg	300, **600**	P G ..	X	0.40	4.00	
Flint [2]	TPB	161	Kubon & Sem Olsen	300, **600**	P G ..	X	0.40	4.00	
Foina [2]	TSR	150-175	Knut Knutsen O.A.S., Haugesund	300, **600**	P G ..	X	0.40	4.00	
Foldenfjord [2]	LCR	200-250	A/S Den Norske Amerikalinje ..	300, **600**	P G ..	X	0.40	4.00	
Fram [2]	TPA	100-150	H. M. Wrangell & Co., A/S ..	300, **600**	P G ..	X	0.40	4.00	
Freden [2]	AQE	150-175	Alexander Bech, Christiania ..	300, **600**	P G ..	X	0.40	4.00	
Frederick Gilbert [2] ..	TSZ	150-200	Willy. C. Gilbert	300, **600**	P G ..	X	0.40	4.00	
Frey [2]	AQC	400	Nils A. Örum, Christiania.. ..	300, **600**	P G ..	X	0.40	4.00	
Frithjof..	**LAE**	—	Navy	—	O ..	—	—	—	
Fritzoe [2]	TPC	300	Bugge and Olsen	300, **600**	P G ..	X	0.40	4.00	
Frogner [2]	TTK	150-200	Fearnley & Eger	300, **600**	P G ..	X	0.40	4.00	
Frøya	**LBD**	—	Navy	—	O ..	—	—	—	
Fynd [2]	LHA	60	Hvalfangerselskapet Nordhavet A S	300, **600**	P G ..	X	0.40	4.00	
Garm	**LBC**	—	Navy	—	O ..	—	—	—	
Gaute [2]	LHE	75-100	Biorn Biornstad	300, **600**	P G ..	X	0.40	4.00	
Gerion	AVK	150-175	Adolph Halvorsen	300, **600**	P G ..	X	0.40	4.00	
Geisha [2]..	AVT	150-175	Winge & Co.	300, **600**	P G ..	X	0.40	4.00	
George Washington LFQ [2]	**LFQ**	**150-200**	**A S " Borga " (P. Olsen)..**	**300, 600**	**P G** ..	**X**	**0.40**	**4.00**	
Gezina [2]	AVJ	100-125	Th. Brovig	300, **600**	P G ..	X	0.40	4.00	
Gijones [2]	LCK	100-125	Skibsaktieselskapet Maderas ..	300, **600**	P G ..	X	0.40	4.00	
Glittertind [2]	TOW	100-150	Kjeld Stub.	300, **600**	P G ..	X	0.40	4.00	
Glommen	**LBB**	—	Navy	—	O ..	—	—	—	
Golaa [2]	**LGM**	**100-150**	**F. Siegwarth**	**300, 600**	**P G** ..	**X**	**0.40**	**4.00**	
Golden Gate [2] ..	**LGR**	**435**	**Knut Knutsen**	**300, 600**	**P G** ..	**X**	**0.40**	**4.00**	
Gran [2]	AIJ	175-200	A S Red. Oldfjell	300, **600**	P G ..	X	0.40	4.00	
Grande Gaard [2] ..	TTG	150-200	Henrik Østervold..	300, **600**	P G ..	X	0.40	4.00	
Graziella [2]	**LWK**	**150-200**	**Fearnley & Eger**	**300, 600**	P G ..	X	0.40	4.00	
Grena [2]	**LHH**	**100-150**	**J. L. Mowinckel**	**300, 600**	P G ..	X	0.40	4 00	
Grib	**LBI**	—	Navy	—	O ..	—	—	—	

Gro [3]	TQA	150-200	A/S Jacob R. Olsen	300, 600	P G	X	0.40	4.00
Grøntoft [3]	AQV	300	T. H. Skogland & Søn, Haugesund	300, 600	P G	X	0.40	4.00
Guernsey [2]	ATB	150-175	Wilh. Wilhelmsen	300, 600	P G	X	0.40	4.00
Gunny [2]	TRV	100-150	Johan Eliassen, Bergen	300, 600	P G	X	0.40	4.00
Gurth [2]	AUB	300	Det Selmerske Rederi	300, 600	P G	X	0.40	4.00
Guvernören [2]	AQK	400	Chr. Christensen jr., Sandefjord	300, 600	P G	X	0.40	4.00
Haakon VII [3]	LDL	160	Det. Nordenfjeldske Dampskib.	300, 450, 600	P G	0100 to 0300 0700 to 0900 1300 to 1500 1900 to 2100	0.20	2.00
Hallfried [3]	LFT	600	P. Kleppe	300, 600	P G	X	0.40	4.00
Hallgrim [2]	AVE	400	P. Kleppe, Bergen	300, 600	P G	X	0.40	4.00
Hamlet [1]	LGD	160	Bruusgaard, Kiosturd & Co., Drammen	300, 600	P G	X	0.20	2.00
Hanna Nielsen [1]	LGI	200-250	B. Stolt Nielsen, Haugesund	300, 600	P G	X	0.40	4.00
Harald Haarfagre	LAB	—	Navy	—	O	—	—	—
Haraldohaug [2]	TTB	300	Aktieselskapet Mercator	300, 600	P G	X	0.40	4.00
Harde [2]	LGV	200-250	H. Kuhnle, Bergen	300, 600	P G	X	0.40	4.00
Harriet [2]	AVP	150-175	P. Kleppe	300, 600	P G	X	0.40	4.00
Hassel [2]	TQC	150-200	A/S Red, Odfjell	300, 600	P G	X	0.40	4.00
Haugarland [2]	ATL	400	H. M. Wrangell & Co.	300, 600	P G	X	0.40	4.00
Haugland [2]	AQJ	300	N. Rögenaes, Haugesund	300, 600	P G	X	0.40	4.00
Haukefjell [4]	AUS	200	Olsen & Ugelstad, Christiania	300, 600	P G	X	0.40	4.00
Havö [3]	LDC	600	Henrik Östervold	300, 600	P G	X	0.40	4.00
Havur [2]	ATR	300	Torp & Wiese, Bergen	300, 600	P G	X	0.40	4.00
H. C. Flood [2]	ASR	150-175	Knut Knutsen O.A.S., Haugesund	300, 600	P G	X	0.40	4.00
Heimdal	LAZ	—	Navy	—	O	—	—	—
Heina [2]	ATG	75-100	J. Ludw. Mowinckels Rederi A/S, Bergen	300, 600	P G	X	0.40	4.00
Helder TSB	TSB	100-150	A/S Jacob. Engers Rederi	300, 600	P G	X	0.40	4.00
Hendrik Lund [2]	AQQ	100-150	Willy C. Gilbert, Bergen	—	—	—	—	—
Hercules LGY [3]	LGY	100-150	Norway-Mexico Gulf Line	300, 600	P G	X	0.40	4.00
Hermes TQT [2]	TQT	300-480	Bruusgaard, Kiosterud & Co.	300, 600	P G	X	0.40	4.00
Hermion [3]	TSC	150-200	Bruusgaard, Kiosterud & Co., Drammen	300, 600	P G	X	0.40	4.00
Hessa [2]	LEG	400	Aalesunds Dampskibsselskap	300, 450, 600	P G	X	0.40	4.00
Hiskö [2] TTF	TTF	150-200	Henrik Ostervold	300, 600	P G	X	0.40	4.00
Hjortnaes [2]	AQB	300	Louis Poulsen & Co., Christiania	300, 600	P G	X	0.40	4.00
H. K. Waage [2]	TRR	100-150	M. Clausen	300, 600	P G	X	0.40	4.00
Holmborg [2]	AQL	300	Skibsaktieselskapet Ringborg, Haugesund	300, 600	P G	X	0.40	4.00
Homledal [2]	LWI	150-200	Fearnley & Eger	300, 600	P G	X	0.40	4.00
Horda [2]	LCP	150-200	J. Ludwig Mowinckels Red. A/S	300, 600	P G	X	0.40	4.00
Hovland [3]	LWL	400	Alf. Lunde	300, 450, 600	P G	X	0.40	4.00
Hubro [2]	AST	200	Bergen Lloyd A/R, Bergen	300, 600	P G	X	0.40	4.00
Hundvaago [2]	AVF	150-175	Henrik Ostervold	300, 600	P G	X	0.40	4.00
Hval	LAN	—	Navy	—	O	—	—	—
Idefjord [2]	ASC	250-300	A/S Den Norske Amerikalinje, Christiania	300, 600	P G	X	0.40	4.00
Ingeborg Bakkevig [3]	LWM	150	T. Bakkevig & Sön A/S	300, 450, 600	P G	X	0.40	4.00
Inger Benedicte [2]	AQW	200	Jacob Kjöde, Bergen	300, 600	P G	X	0.40	4.00
Inneroy [2]	AUQ	200	Kluver & Co., Christiania	300, 600	P G	X	0.40	4.00
Iris LFH [3]	LFH	120	Det Bergenske Dampskibsselskab	300, 450, 600	P G	X	0.20	2.00
Irma [3]	LDQ	240	Det Bergenske Dampskibsselskab.	300, 450, 600	P G	X	0.20	2.00
Isfjeld [2]	TRU	200	Northern Exploration Co., Ltd.	300, 600	P G	X	0.40	4.00

Ship Stations—*Continued*

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NORWAY—*contd.*							Francs.	Francs.	
Jacob Christensen [2]	ATZ	125	Jacob Christensen, Bergen	300, 450, **600**	P G	X	0.40	4.00	
Jason LEL [2]	LEL	110	A/S Norsk Bjergningskompani	300, **600**	P G	X	—	—	
Jessie [2]	LWA	400	Louis Wetlasen	300, 450, **600**	P G	X	0.40	4.00	
Jo	LAQ	—	Navy	—	O	—	—	—	
Joh. Ludw. Mowinckel [2]	TPL	300	Olaf Örvig, Bergen	300, **600**	P G	X	0.40	4.00	
Jupiter LEB [2]	LEB	135	Det Bergenske Dampskibsselskab	300, 450, **600**	P G	0230 to 0300 0830 to 0900 1430 to 1500 2030 to 2100	0.20	2.00	
Kaggefos [2]	TSV	150-200	Otto & Thor Thoresen	300, **600**	P G	X	0.40	4.00	
Kalfarli [1]	LGF	200-250	D. Steen, Kristiania	300, **600**	P G	X	0.40	4.00	
Kalken [2]	TRW	300	Kristiansunds Dampskibsrederi A/S	300, **600**	P G	X	0.40	4.00	
Kamfjord [2]	LEO	200	F. S. Thorn & Co., Christiania	300, **600**	P G	X	0.40	4.00	
Kapland [2]	AUA	200	Carl Wildhagen & Co., Sandefjord	300, **600**	P G	X	0.40	4.00	
Kapolna [2]	ATI	200	Carl Wildhagen & Co., Sandefjord	300, **600**	P G	X	0.40	4.00	
Kaprino [2]	ATY	200	Carl Wildhagen & Co.	300, **600**	P G	X	0.40	4.00	
Karmoy [2]	ASG	150-175	John K. Haaland, Haugesund	300, **600**	P G	X	0.40	4.00	
Key West [2]	LGQ	435	Knut Knutsen	300, **600**	P G	X	0.40	4.00	
Kinghorn	LEJ	200-250	A/S Britanja	300, **600**	P G	X	0.40	4.00	
Kjell	LAT	—	Navy	—	O	—	—	—	
Kjellbergen [2]	TUX	300	T. Evers, Haugesund	300, **600**	P G	X	0.40	4.00	
Klem [2]	TQM	100	Hvalfangerselskapet Nordhavet A/S	300, **600**	P G	X	0.40	4.00	
Klosterfos [2]	AUL	100-125	Otto & Thor Thoresen A/S, Christiania	300, **600**	P G	X	0.40	4.00	
Knut Hamsun [2]	LWB	300	Olaf Örvig	300, 450, **600**	P G	X	0.40	4.00	
Knut Jarl [2]	LCA	150-200	Det Nordenfjeldske Dampskibsselskap	300, **600**	P G	X	0.40	4.00	
Kong Harald [2]	LDK	160	Det Nordenfjeldske Dampskibsselskab	300, **600**	P G	0100 to 0300 0700 to 0900 1300 to 1500 1900 to 2100	0.20	2.00	
Kongsfoss [2]	LCE	150-200	Thor Thoresen jr., Ltd., A/S	300, **600**	P G	X	0.40	4.00	
Kongsgaard [2]	AQM	200	Brödrene Olsen, Stavanger	300, **600**	P G	X	0.40	4.00	
Konsul Olsen [2]	ATU	200	Bugge & Olsen, Larvik	300, **600**	P G	X	0.40	4.00	
Kristianiafjord [2]	TTH	150-200	Den. Norske Amerikalinje A/S	300, **600**	P G	X	0.40	4.00	
Krosfond [2]	TQO	100-150	Svithunlinjen A/S	300, **600**	P G	X	0.40	4.00	
Landaas LCX [2]	LCX	100-150	Johan. Erland, Bergen	300, **600**	P G	X	0.40	4.00	
Landaas LHB [2]	LHB	435	B. Stolt Nielsen	300, **600**	P G	X	0.40	4.00	

Laugford [2]	TQQ	100-150	Svithunlinjen A/S	300, 600	P G	X	0.40	4.00
Langtind [2]	ASV	200	S. Ugelstad & Co., Brevik	300, 600	P G	X	0.40	4.00
Laugen	LBH	—	Navy	—	O	—	—	—
Laura Skogland [2]	ASU	450	T. H. Skogland & Son, Haugesund	300, 600	P G	X	0.40	4.00
Leseps [2]	ATX	150-175	H. M. Wrangell & Co.	300, 600	P G	X	0.40	4.00
Lifjeld	ASX	300	Harald Grieg Martens, Bergen	300, 600	P G	X	0.40	4.00
Liss [2]	AVQ	200-250	A/S Krezimasko	300, 600	P G	X	0.40	4.00
Liv [2]	AQD	400	Nils. A. Örum, Christiania	300, 450, 600	P G	X	0.40	4.00
Loch Tay [2]	TPV	250	Alf Monsen	300, 600	P G	X	0.40	4.00
Lom	LAP	—	Navy	—	O	—	—	—
Lorentz W. Hansen [2]	TPT	150-175	Lorentz W. Hansen	300, 600	P G	X	0.40	4.00
Louisiana TPF [2]	TPF	150-200	Wilh. Wilhemsen	300, 600	P G	X	0.40	4.00
Lövland [2]	TTX	300	Thorvald Pedersen	300, 600	P G	X	0.40	4.00
Lovstakken [2]	ARM	150	Andreas Olsen, Bergen	300, 450, 600	P G	X	0.40	4.00
Luise Nielsen [1]	LGJ	200-250	B. Stolt Nielsen, Haugesund	300, 600	P G	X	0.40	4.00
Lyderhorn [2]	TQR	100-150	Claus Schoubye	300, 600	P G	X	0.40	4.00
Lygenfjord [2]	LFM	100-150	Den Norske Amerika-Line	300, 600	P G	X	0.40	4.00
Malmanger [2]	TQZ	100-150	Westfal Larsen & Co., A/S	300, 600	P G	X	0.40	4.00
Mantilla TPG [2]	TPG	100-150	Wilh. Wilhemsen	300, 600	P G	X	0.40	4.00
Margit Skogland [2]	TSM	242	T. H. Skogland & Son, A/S	300, 600	P G	X	0.40	4.00
Maricopa [2]	LEE	100-150	Akties-Tankfart	300, 600	P G	X	0.40	4.00
Maridal [2]	TQU	150-200	Tryggve Sagen	300, 600	P G	X	0.40	4.00
Marie Nielson [2]	TSO	100-150	B. Stolt Nielsen	300, 600	P G	X	0.40	4.00
Marita [2]	ASH	150-175	Aktieselskapet Bruusgaard	300, 600	P G	X	0.40	4.00
Marshall	AUU	—	Henrik Ostervold	300, 450, 600	P G	X	0.40	4.00
Mathilda [2]	LDJ	300	Jacob Christensen, Bergen	300, 450, 600	P G	X	0.40	4.00
Maud [2]	ARW	300	Hjalmar Röed & Co., Naes	300, 600	P G	X	0.40	4.00
Melderskin [2]	ARZ	300	Joh. Ludw. Mowinckel	300, 600	P G	X	0.40	4.00
Mesna [1]	LEV	150-200	Den Norske Afrika & Austral.	300, 600	P G	X	0.40	4.00
Mexicano LDH [2]	LDH	270-320	Norway-Mexico Gulf Line	300, 600	P G	0800 to 2400	0.40	4.00
M. H. Kongshavn [2]	ARP	300	A/S M. H. Kongshaven & Sönner	300, 600	P G	X	0.40	4.00
Mimer [2]	TRQ	75-100	Skibsaktieselskapet Maderas	300, 600	P G	X	0.40	4.00
Mira [2]	LFJ	120	Det Bergenske Dampskibsselskab	300, 450, 600	P G	X	0.20	2.00
Mirjam [2]	LCG	150-200	Det Selmerske Rederi	300, 600	P G	X	0.40	4.00
Mod [2]	TRP	150-200	Ivar An. Christensen	300, 600	P G	X	0.40	4.00
Modemi [2]	ATN	100-125	Ivar An. Christensen, Christiania	300, 600	P G	X	0.40	4.00
Modesta [1]	TTS	150-200	Ivar An. Christensen	300, 600	P G	X	0.40	4.00
Modica [2]	TQS	150-200	Ivar An. Christensen	300, 600	P G	X	0.40	4.00
Modig [2]	TQX	100-150	Ivar An. Christensen	300, 600	P G	X	0.40	4.00
Modum [2]	TST	150-200	Ivar. An. Christensen	300, 600	P G	X	0.40	4.00
Mons [2]	AUK	150-175	M. Clausen, Haugesund	300, 600	P G	X	0.40	4.00
Montana ARL [2]	ARL	200-250	Wilh. Wilhelmsen, Christiania	300, 600	P G	X	0.40	4.00
Morgana [2]	LHZ	400	Jespersen	300, 450, 600	P G	X	0.40	4.00
Nanna Stub [2]	TQE	150-200	Kjeld Stub	300, 600	P G	X	0.40	4.00
Navarra TTP [2]	TTP	150-200	Fearnley & Eger	300, 600	P G	X	0.40	4.00
Negus [2]	TRL	300	Olaf Örvig	300, 600	P G	X	0.40	4.00
Nepos [2]	TTW	300	Olaf Örvig	300, 600	P G	X	0.40	4.00
Nevis [2]	LHN	—	Olaf Örvig	—	P G	X	0.40	4.00
Nidaros [2]	LEK	110	A/S. Norsk Bjergningskompani	300, 600	P G	X	—	—
Niels Nielsen [1]	LGH	200-250	B. Stolt Nielsen, Haugesund	300, 600	P G	X	0.40	4.00
Nils [2]	LWV	60-80	Aktieselskapet Nesjar	300, 600	P G	X	0.40	4.00
Nord AUM [2]	AUM	150-175	O. & H. Holta, Skien	300, 600	P G	X	0.40	4.00
Nordfjeld [2]	TRO	150-200	H. C. Gorrissen	300, 600	P G	X	0.40	4.00
Nordkyn AUW [2]	AUW	200-250	H. C. Gorrissen	300, 600	P G	X	0.40	4.00
Nordkyn TQH [2]	TQH	150-200	Albert Harloff	300, 600	P G	X	0.40	4.00

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Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
NORWAY—*contd.*							Francs.	Francs.	
Nordnaes [2]	AQA	200	Louis Poulsen & Co., Christiania	300, **600**	P G	X	0.40	4.00	
Nordstrand	TPH	200	C. B. Nielsen	300, **600**	P G	X	0.40	4.00	
Norge	LAC	—	Navy	—	O	—	—	—	
Noruega [2]	LDG	180	Norway-Mexico Gulf Line	300, **600**	P G	X	0.40	4.00	
Nyhavn [2]	TQK	150-175	Chr. Haaland	300, **600**	P G	X	0.40	4.00	
Octo [2]	TSP	100-150	B. Stolt Nielsen	300, **600**	P G	X	0.40	4.00	
Olaf Kyrre [2]	ASF	300	Bergh & Helland, Bergen	300, **600**	P G	X	0.40	4.00	
Oria [2]	TTO	150-200	Fearnley & Eger	300, **600**	P G	X	0.40	4.00	
Orla [4]	AUJ	150-175	Ivar An. Christensen, Christiania	300, **600**	P G	X	0.40	4.00	
Orn II [1]	LDV	160-270	A/S. Ornen, Sandefjord	300, 450, **600**	P G	X	0.40	4.00	
Orwell LWQ [2]	LWQ	600	A/S Tönsberg Hvalfangeri	300, 450, **600**	P G	X	0.40	4.00	
Osterdal [2]	TQV	150-200	Tryggve Sagen	300, **600**	P G	X	0.40	4.00	
Ottar Jarl [2]	TSN	150-200	Det. Nordenfjeldske Dampskibs-selskab	300, **600**	P G	X	0.40	4.00	
Ottawa LCS [2]	LCS	200	Fred. Th. Bergh	300, 450, **600**	P G	X	0.40	4.00	
Otto Sverdrup	AQN	150-175	Bergh & Helland	300, **600**	P G	X	0.40	4.00	
Ovre [2]	ARC	100-150	Milberg & Co., Christiania	300, **600**	P G	X	0.40	4.00	
Papelera [2]	TTN	150-200	Fearnley & Eger	300, **600**	P G	X	0.40	4.00	
Poljana [2]	TRH	100-150	Winge & Co.	300, **600**	P G	X	0.40	4.00	
Porsanger LCZ [2]	LCZ	150-200	Westfal Larsen & Co., A/S	300, **600**	P G	X	0.40	4.00	
Proteus ATQ [2]	ATQ	100-150	H.M. Wrangell & Co.	300, **600**	P G	X	0.40	4.00	
Ragnvald Jarl [2]	ART	200-250	Det Nordenfjeldske Dampskibs-selskab	300, **600**	P G	X	0.40	4.00	
Ramfoss [2]	LCF	150-200	Thor Thoresen jr., Ltd., A/S	300, **600**	P G	X	0.40	4.00	
Ranenfjord [2]	LGS	200-250	Den Norske Amerika-Line	300, **600**	P G	X	0.40	4.00	
Ravn	LBG	—	Navy	—	O	—	—	—	
Ravnefjell [2]	AUT	200	Olsen & Ugelstad. Christiania	300, **600**	P G	X	0.40	4.00	
Regulus [2]	LHD	300	A. O. Lindvig	300, **600**	P G	X	0.20	2.00	
Remus AVU [2]	AVU	125	A. O. Lindvig	300, 450, **600**	P G	X	0.40	4.00	
Rena [2]	LFD	150-250	Den Norske Afrika- og Aust.	300, **600**	P G	X	0.40	4.00	
Renteria [2]	TTM	150-200	Fearnley & Eger	300, **600**	P G	X	0.40	4.00	
Rinda [2]	LEX	150-200	Den Norske Afrika-og Australiel-linge	300, **600**	P G	X	0.40	4.00	
Ringhorn [2]	AUR	150-175	Albert Schjelderup, Bergen	300, **600**	P G	X	0.40	4.00	
Rio de Janeiro LDM [2]	LDM	150-250	Det Nordenfjeldske Dampskib.	300, **600**	P G	X	0.40	4.00	
Rio de la Plata LDN [2]	LDN	150-250	Det Nordenfjeldske Dampskib.	300, **600**	P G	X	0.40	4.00	
Rio Grande LCD [2]	LCD	150-200	Det Nordenfjeldske Dampskib	300, **600**	P G	X	0.40	4.00	
Rodfjell [2]	AVI	150-175	KristiansundsDampskibsrederiA/S	300, **600**	P G	X	0.40	4.00	
Rodskjaer [1]	LRP	100-150	Jacobsen & Co., Langesund	300, **600**	P G	X	0.40	4.00	

Rolf Jarl [2]	ARB	200-250	Det. Nordentjeldske Dampskibs-selskab	300, **600**	P G ..	X	0.40	4.00
Romulus AVD [2] ..	AVD	125	A. O. Lindvig	300, 450, **600**	P G ..	X	0.40	4.00
Ronald [2]	TSA	539	N. Bugge, Tonsberg	300, **600**	P G ..	X	0.40	4.00
Rcsegg [2]	TSL	75-100	Camillo Eitzen & Co.	300, **600**	P G ..	X	0.40	4.00
Rövoer [2]	LHG	**100-150**	**J. K. Haaland**	300, **600**	P G ..	X	0.40	4.00
Rowena TSJ [2] ..	TSJ	150	A/S Det Selmerske Rederi ..	300, 450, **600**	P G ..	X	0.40	4.00
Royal [2]	AUV	100	O. A. T. Skjelbred	300, 450, **600**	P G ..	X	0.40	4.00
Rutenfjel [2]	AUH	150-175	J. Johannessen	300, **600**	P G ..	X	0.40	4.00
Ruth AVC [2]	AVC	300	Hagb. Waage	300, **600**	P G ..	X	0.40	4.00
Rygja [2]	LCO	150-200	J. Ludwig Mowinckels Red. A/S	300, **600**	P G ..	X	0.40	4.00
Sœl	LAL	—	Navy	—	O ..	—	—	—
Sagaland LGP [2] ..	LGP	**100-150**	**R. Amlie**	**300, 600**	P G ..	X	0.40	4.00
Sagaland AVV [2] ..	AVV	150-175	Dampskibsaktieselskapet Vestland	300, **600**	P G ..	X	0.40	4.00
Salerno LEH [2].. ..	LEH	150-200	Otto Thoresen	300, **600**	P G ..	X	0.40	4.00
Salina AQH [2] ..	AQH	125	H. M. Wrangell & Co., A/S, Haugesund	300, 450, **600**	P G ..	X	0.40	4.00
Salonica [2]	AUE	150-175	Otto & Thor Thoresen, Christiania	300, **600**	P G ..	X	0.40	4.00
Salvage [2]	LFY	**150-200**	**A/S. Norsk Bjergningskompani**	**300, 600**	P G ..	X	—	—
Salvator [2]	LEM	**150-250**	**A/S. Norsk Bjergningskompani**	**300, 600**	P G ..	X	—	—
Samnanger [2] ..	LCY	150-200	Westfal Larsen & Co., A/S ..	300, **600**	P G ..	X	0.40	4.00
Sangstad [2]	TSW	100-150	Aktieselskapet "TO"	300, **600**	P G ..	X	0.40	4.00
Saphir [2]..	TSE	125	P. Lindoe & Co., A/S	300, **600**	P G ..	X	0.40	4.00
Sardinia TRC [2] ..	TRC	100-150	Otto Thoresen	300, **600**	P G ..	X	0.40	4.00
Sarpen ASA [2] ..	ASA	200	A/S Borregaard, Christiania ..	300, **600**	P G ..	X	0.40	4.00
Sarpen LBE	LBE	—	Navy	—	O ..	—	—	—
S. B. Lund [2]	TQI	150-200	Jens G. F. Lund	300, **600**	P G ..	X	0.40	4.00
Segovia [2]	TRF	100-150	Otto Thoresen	300, **600**	P G ..	X	0.40	4.00
Seirstad [2]	ARH	200-250	A. F. Klaveness & Co., Christiania	300, **600**	P G ..	X	0.40	4.00
Sekstant [2]	AQR	300	Johan Troye Hansen, Bergen ..	300, **600**	P G ..	X	0.40	4.00
Sevilla [2]..	TRE	100-150	Otto Thoresen	300, **600**	P G ..	X	0.40	4.00
Sierra Nevada [2] ..	TPR	200-250	Lorentz W. Hansen	300, **600**	P G ..	X	0.40	4.00
Sild	LBF	—	Navy	—	O ..	—	—	—
Simla [1]	LEW	150-200	**Den Norske Afrika & Aust.** ..	300, **600**	P G ..	X	0.40	4.00
Sinaloa [2]	LHB	**300**	A. O. Lindvig	**300, 600**	P G ..	X	0.20	2.00
Sirrah LWR [2] ..	LWR	400	H. A. Christensen	300, 450, **600**	P G ..	X	0.40	4.00
Sixtyfour	AVH	150-175	L. Severin Skougaard	300, **600**	P G ..	X	0.40	4.00
Sjömand [2]	TPO	200	T. Dannevig & Co.	300, **600**	P G ..	X	0.40	4.00
Skard [2]	ATH	200	B. A. Sanne, Christiania.. ..	300, **600**	P G ..	X	0.40	4.00
Skarv	LAR	—	Navy	—	O ..	—	—	—
Skiensfjord [2] ..	TTU	150-200	Dennorske Amerikalinje A/S ..	300, **600**	P G ..	X	0.40	4.00
Skogland [2]	AVA	300	T. H. Skogland & Son, A/S ..	300, **600**	P G ..	X	0.40	4.00
Skogstad [2]	ARF	100-150	A. F. Klaveness & Co., Christiania	300, **600**	P G ..	X	0.40	4.00
Skolma [2]	ARR	400	Aalesunds Dampskibsrederi ..	300, **600**	P G ..	X	0.40	4.00
Skrei	LAM	—	Navy	—	O ..	—	—	—
Skrymer [2]	ASE	300	B. A. Sanne, Christiania.. ..	300, **600**	P G ..	X	0.40	4.00
Snefjeld [2]	TSQ	200	Harald Grieg Martens	300, **600**	P G ..	X	0.40	4.00
Snehaetten [2] ..	TRN	200	Olaf Orvig	300, **600**	P G ..	X	0.40	4.00
Solborg [2]	AQP	300	A. F. Borch & Sönner, Ltd., Drammen	300, **600**	P G ..	X	0.40	4.00
Solstreif [1]	LHL	300	**Chr. Nielsen & Co.**	**300, 600**	P G ..	X	0.40	4.00
Solvaer [2]	TRX	200	Muller & Johnsen, Bergen ..	300, 450, **600**	P G ..	X	0.40	4.00
Solvang [2]	AQS	200	Brödrene Olsen, Stavanger ..	300, **600**	P G ..	X	0.40	4.00
Solveig Skogland [2] ..	LHY	**150-200**	**T. H. Skogland & Son** ..	**300, 600**	P G ..	X	0.40	4.00
Songa [2]	TPS	200-250	Lorentz W. Hansen	300, **600**	P G ..	X	0.40	4.00

Ship Stations—*Continued*

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NORWAY—*contd.*							Francs.	Francs.	
Songelv [2]	ATP	100-150	S. O. Stray & Co., Ltd., A/S	300, **600**	P G	X	0.40	4.00	
Songvaar [2]	LGC	200-250	S. O. Stray & Co., Ltd., A/S, Christiansand S.	300, **600**	P G	X	0.40	4.00	
Sörland [2]	TPP	150-175	S. O. Stray & Co.	300, **600**	P G	X	0.40	4.00	
Spette [2]	AQY	100-150	Björnstad & Braekhus, Bergen	300, **600**	P G	X	0.40	4.00	
Stavangerfjord [1]	**LFS**	**150-200**	**Den Norske Amerika-Linje, Krist.**	**300, 600**	**P G**	**N**	**0.40**	**4.00**	
Steinstad [2]	ARD	100-150	A. F. Klaveness & Co.	300, **600**	P G	X	0.40	4.00	
Sterling LDB [2]	**LDB**	**160**	**A/S Ganger Rolf**	**300, 600**	**P G**	**N**	**0.28**	**2.80**	
Stiklestad [2]	ARE	100-150	A. F. Klaveness & Co., Christiania	300, **600**	P G	X	0.40	4.00	
Stokke [2]	TTY	107	N. Chr. Evensen	300, **600**	P G	X	0.40	4.00	
Stolt-Nielsen [2]	TPD	150-200	B. Stolt Nielsen	300, **600**	P G	X	0.40	4.00	
Storaker [2]	ARJ	150-175	S. O. Stray & Co., Ltd., A/S	300, **600**	P G	X	0.40	4.00	
Storborg [2]	LCU	700-1,000	Dampskibsaktieselskapet Storborg	300, **600**	P G	X	0.40	4.00	
Storfjeld [2]	TQP	200	Harald Grieg Martens	300, **600**	P G	X	0.40	4.00	
Storviken [2]	**LHJ**	**900**	**Haakon J. Wallem**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Strinda [2]	**LFO**	**100-150**	**J. Ludwig Mowinckel**	**300, 600**	**P G**	**X**	**0.40**	**4.00**	
Svane [2]	ASS	200	D/S, A/S Erick Lea, Bergen	300, **600**	P G	X	0.40	4.00	
Svartfond [2]	ATF	150-175	Sigval Bergensen, Stavanger	300, **600**	P G	X	0.40	4.00	
Svend Foyn [1] [2]	LEC	400	A/S Sydhavet	300, **600**	P G	X	0.40	4.00	
Sydfold [2]	**LHX**	**125-150**	**M. Clansen**	**300, 450, 600**	**P G**	**X**	**0.40**	**4.00**	
S. Andres [2]	TRD	100-150	Otto Thoresen	300, **600**	P G	X	0.40	4.00	
S. José TRB [2]	TRB	100-150	Otto Thoresen	300, **600**	P G	X	0.40	4.00	
S. Mateo TSF [2]	TSF	100-150	Otto & Thor Thoresen, A/S	300, **600**	P G	X	0.40	4.00	
S. Miguel TRA [2]	TRA	100-150	Otto Thoresen	300, **600**	P G	X	0.40	4.00	
S. Paulo AVG [2]	AVG	Day 350-700 Night 700-1,400	Otto & Thor Thoresen A/S	300, 450, **600**	P G	X	0.40	4.00	
Tabor [2]	ASQ	150-175	Wilh. Wilhelmsen	300, **600**	P G	X	0.40	4.00	
Talabot [2]	**LFI**	**500**	**N. S. Bjonness & Son**	**300, 500, 600**	**P G**	**X**	**0.40**	**4.00**	
Talisman [2]	ASL	100-125	Wilh. Wilhelmsen	300, **600**	P G	X	0.40	4.00	
Tana [2]	AVO	200-250	Wilh. Wilhelmsen	300, **600**	P G	X	0.40	4.00	
Tanafjord [2]	TTJ	150-200	Dennorske Amerikalinje A/S	300, **600**	P G	X	0.40	4.00	
Tatjana [2]	TTR	250-300	Winge & Co., Christiania	300, **600**	P G	X	0.40	4.00	
Tela [2]	ASY	300	Brodrene Wilhelmsen	300, **600**	P G	X	0.40	4.00	
Tento [2]	LWW	100-125	J. W. Prebensen	300, **600**	P G	X	0.40	4.00	
Terne [2]	ASW	200	Dampskibs A/S Fiosanger, Bergen	300, **600**	P G	X	0.40	4.00	
Terrier [2]	ATA	150-175	Wilh. Wilhelmsen	300, **600**	P G	X	0.40	4.00	

Theodore Roosevelt TRK [2]	TRK	200-250	Fred. Olsen & Co.	300, 600	P G	..	X	0.40	4.00
Thode Fagelund [2]	TPN	150-200	**Wilh. Wilhelmsen**	300, 600	P G	..	X	0.40	4.00
Thomas Haaland [2]	LCB	100-125	**John K. Haaland**	300, 600	P G	..	X	0.40	4.00
Thomas Krag [2]	ATO	300	**Jan. O. Ostervold, Bergen**	300, 600	P G	..	X	0.40	4.00
Thor [1] [2]	AQG	400	**Bryde & Dahls Hvalfangerselskap A/S Sandefjord**	300, 600	P G	..	X	0.40	4.00
Thordis [2]	LDE	500	**O. T. Tonnevold**	300, 500, 600	P G	..	X	0.40	4.00
Thorhild [2]	TRS	150-175	O. T. Tonnevold, Grimstad	300, 600	P G	..	X	0.40	4.00
Thorvald Halvorsen [1]	LGE	100-150	**P. Kleppe, Bergen.**	300, 600	P G	..	X	0.40	4.00
Tiger AUZ [2]	AUZ	200-250	A/S Vestlanaske Petroleums-compagni	300, 600	P G	..	X	0.40	4.00
Times [2]	LWT	150-200	Wilh. Wilhelmsen	300, 600	P G	..	X	0.40	4.00
Tizona [2]	ARN	150-175	K. Anderson, Fredrikstad	300, 600	P G	..	X	0.40	4.00
Tolosa [2]	AQT	200-250	Fearnley & Eger, Christiania	300, 600	P G	..	X	0.40	4.00
Tonjer [2]	TQG	100-150	H. M. Wrangell & Co.	300, 600	P G	..	X	0.40	4.00
Topdalsfjord [2]	ASB	250-300	A/S Den Norske Amerikalinje	300, 600	P G	..	X	0.40	4.00
Tordenskjold ASK [2]	ASK	150-175	Wilh. Wilhelmsen	300, 600	P G	..	X	0.40	4.00
Torrey [2]	ARO	150-175	Martin Mosvold, Christiania	300, 600	P G	..	X	0.40	4.00
Tosca [2]	TRI	100-150	Winge & Co.	300, 600	P G	..	X	0.40	4.00
Tosto TSD [2]	TSD	100-150	B. Stolt Nielsen	300, 600	P G	..	X	0.40	4.00
Tricolor [2]	ASZ	150-175	Wilh. Wilhelmsen	300, 600	P G	..	X	0.40	4.00
Trondhjemsfjord [2]	TTI	150-200	Den Norske Amerikalinje A/S	300, 600	P G	..	X	0.40	4.00
Troubadour [2]	TPM	150-200	Wilh. Wilhelmsen	300, 600	P G	..	X	0.40	4.00
Truth [2]	LWY	100-125	O. A. T. Skjelbred	300, 600	P G	..	X	0.40	4.00
Tugela [2]	ATV	200-250	Wilh. Wilhelmsen	300, 600	P G	..	X	0.40	4.00
Tune [2]	ARG	150-175	Ragn. M. Viik, Tönsberg	300, 600	P G	..	X	0.40	4.00
Tyr [2]	ASM	100-125	Wilh. Wilhelmsen	300, 600	P G	..	X	0.40	4.00
Tysla [2]	LFF	150-250	**Den Norske Afrika- og Aust.**	300, 600	P G	..	X	0.40	4.00
Ulla LCV [2]	LCV	300	A/S Norsk Bjergningskompagni	300, 450, 600	P G	..	X	0.40	4.00
Ullstad [2]	LCW	100-150	Bendix J. Grefstad	300, 600	P G	..	X	0.40	4.00
Unita [2]	AUG	150-175	H. M. Wrangell & Co., Haugesund	300, 600	P G	..	X	0.40	4.00
Uraed [2]	AVR	100	A/S Norsk Bjergningskompagni	300, 450, 600	P G	..	X	—	—
Urd [2]	TPU	200-250	Jacob R. Olsen	300, 600	P G	..	X	0.40	4.00
Urter	LEA	100-150	J. K. Haaland	300, 600	P G	..	X	0.40	4.00
Utsire [2]	LHF	100-150	J. K. Haaland	300, 600	P G	..	X	0.40	4.00
Vaarli [1]	LGG	200-250	Brödrene Odfjeli	300, 600	P G	..	X	0.40	4.00
Valdemar Skogland	AVN	400	T. H. Skogland & Son, A/S	300, 600	P G	..	X	0.40	4.00
Vela [2]	LCI	100-125	Det Bergenske Dampskibsselskab	300, 600	P G	..	X	0.40	4.00
Venus LDO [2]	LDO	240	**Det Bergenske Dampskibsselskab**	300, 450, 600	P G	..	X	0.20	2.00
Vestheim [2]	TSK	200-250	Halfdan-Ditlef-Simonsen & Co., Christiania	300, 600	P G	..	X	0.40	4.00
Vestland [2]	AQI	200	Rich. Amlie, Haugesund	300, 600	P G	..	X	0.40	4.00
Viking TSS [2]	TSS	100-150	M. Clausen	300, 600	P G	..	X	0.40	4.00
Viking LGU [2]	LGU	200-250	**M. Clausen**	300, 600	P G	..	X	0.40	4.00
Vinstra [2]	LFE	150-250	**Den Norske Afrika- og Aust.**	300, 600	P G	..	X	0.40	4.00
Wagland [2]	AQX	200	K. Andersen, Fredrikstad	300, 600	P G	..	X	0.40	4.00
Wellington LGO [1]	LGO	100-150	**J. Saetveit**	300, 600	P G	..	X	0.40	4.00
Wilfred [2]	TSH	150	A/S Det Selmerske Rederi	300, 450, 600	P G	..	X	0.40	4.00
Zeta [1]	LDR	150	**Det Bergenske Dampskibsselskab.**	300, 450, 600	P G	..	X	0.20	2.00
PERU									
Huallaga [1]	OCH	250	**Cia Peruana Vap y Dique del Callao**	300, 600	P G	..	X	0.40	—
Mantaro [1]	OCM	250	**Cia Peruana Vap y Dique del Callao**	300, 600	P G	..	X	0.40	—
Ucayali [1]	OCU	250	**Cia Peruana Vap y Dique del Callao**	300, 600	P G	..	X	0.40	—
Urubamba [1]	OCR	250	**Cia Peruana Vap y Dique del Callao**	300, 600	P G	..	X	0.40	—

[1] **Operated and controlled by the Marconi International Marine Com. Co., Ltd., London**

Ship Stations—*Continued*

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PORTUGAL							Francs.	Francs.	
Africa CSA [1]	CSA	100-150	—	300, **600**	P G	N	0.40	4.00	[1] Operated and controlled by the Société Anonyme Internationale de Télégraphie sans Fils, Brussels
Amarante [1]	CUC	100-150	—	300, **600**	P G	N	0.40	4.00	
Beira CSB [1]	CSB	100-150	—	300, **600**	P G	N	0.40	4.00	
Bolama [1]	CSO	100-150	—	300, **600**	P G	X	0.40	4.00	
Coimbra [1]	CSK	100-150	—	300, **600**	P G	N	0.40	4.00	
Congo [1]	CUB	100-150	—	300, **600**	P G	N	0.40	4.00	
Cunene [1]	CSQ	100-150	—	300, **600**	P G	N	0.40	4.00	
Dondo [1]	CSD	100-150	—	300, **600**	P G	X	0.40	4.00	
Esposende [1]	CSV	100-150	—	300, **600**	P G	X	0.40	4.00	
Estremadura [1]	CSJ	100-150	—	300, **600**	P G	X	0.40	4.00	
Faro [1]	CSY	100-150	—	300, **600**	P G	N	0.40	4.00	
Fernao Veloso [1]	CSG	100-150	—	300, **600**	P G	N	0.40	4.00	
Figueira [1]	CUG	100-150	—	300, **600**	P G	N	0.40	4.00	
Funchal [1]	CSF	100-150	—	300, **600**	P G	N	0.40	4.00	
Gaia [1]	CSI	100-150	—	300, **600**	P G	N	0.40	4.00	
Ganda [1]	CSU	100-150	—	300, **600**	P G	X	0.40	4.00	
Gaza [1]	CUD	100-150	—	300, **600**	P G	N	0.40	4.00	
Gil Eannes [1]	CUN	100-150	—	300, **600**	P G	N	0.40	4.00	
Goa [1]	CUD	100-150	—	300, **600**	P G	N	0.40	4.00	
Granja [1]	CUJ	100-150	—	300, **600**	P G	X	0.40	4.00	
India CUI [1]	CUI	100-150	—	300, **600**	P G	N	0.40	4.00	
Lagos [1]	CUE	100-150	—	300, **600**	P G	X	0.40	4.00	
Leca [1]	CSH	100-150	—	300, **600**	P G	N	—	—	
Lima CSN [1]	CSN	100-150	—	300, **600**	P G	N	0.40	4.00	
Lourenco Marques [1]	CUF	100-150	—	300, **600**	P G	N	0.40	4.00	
Maio [1]	CUK	100-150	—	300, **600**	P G	N	0.40	4.00	
Mendes Barata [1]	CUR	100-150	—	300, **600**	P G	N	0.40	4.00	
Minho [1]	CUM	100-150	—	300, **600**	P G	X	0.40	4.00	
Mocambique [1]	CSM	100-150	—	300, **600**	P G	N	0.40	4.00	
Mormugao [1]	CUH	100-150	—	300, **600**	P G	N	0.40	4.00	
Mossamedes [1]	CSE	100-150	—	300, **600**	P G	N	0.40	4.00	
Pangim [1]	CUX	100-150	—	300, **600**	P G	N	0.40	4.00	
Peniche [1]	CSX	100-150	—	300, **600**	P G	N	0.40	4.00	
Peninsular [1]	CSR	100-150	—	300, **600**	P G	N	0.40	4.00	
Porto [1]	CSL	100-150	—	300, **600**	P G	N	0.40	4.00	
Porto Alexandre [1]	CUL	100-150	—	300, **600**	P G	N	0.40	4.00	
Portugal CSP [1]	CSP	100-150	—	300, **600**	P G	N	0.40	4.00	
Pungue [1]	CUU	100-150	—	300, **600**	P G	X	0.40	4.00	
Quelimane [1]	CUQ	100-150	—	300, **600**	P G	N	[illegible]	[illegible]	

Sacavem [1]	CUX	100-150	—	300, 600	P G	N	0.40	4.00	
Sado [1]	CSC	100-150	—	300, 600	P G	X	0.40	4.00	
Sines [1]	CSW	100-150	—	300, 600	P G	N	0.40	4.00	
S. Antao [1]	CUW	100-150	—	300, 600	P G	N	0.40	4.00	
S. Jorge [1]	CUS	100-150	—	300, 600	P G	N	0.40	4.00	
S. Miguel CSS [1]	CSS	100-150	—	300, 600	P G	N	0.40	4.00	
S. Tiago CUT [1]	CUT	100-150	—	300, 600	P G	N	0.40	4.00	
S. Vincent [1]	CUP	100-150	—	300, 600	P G	N	0.40	4.00	
Traz-os-Montes [1]	CST	100-150	—	300, 600	P G	N	0.40	4.00	
Viana [1]	CUO	100-150	—	300, 600	P G	N	0.40	4.00	
Vulcano CTM [1]	CTM	100-150	—	300, 600	P G	N	0.40	4.00	
ROUMANIA									
Dacia [1]	CVD	240	Government Marine Department	600	P R [2]	N	0.30	3.00	[1] Operated and controlled by the owners
Imperatul Traian [1]	CVF	240	Government Marine Department	600	P R [2]	N	0.30	3.00	[2] Public correspondence is with Constanza Tunnel only
Principesa Maria [1]	CVM	240	Government Marine Department	600	P R [2]	N	0.30	3.00	
Regele Carol I. [1]	CVC	240	Government Marine Department	600	P R [2]	N	0.30	3.00	
Romania [1]	CVR	240	Government Marine Department	600	P R [2]	N	0.30	3.00	
RUSSIA						Time of Petrograd			
Admiral Makharoff	RGK	—	—	—	O	—	—	—	[1] Operated by the owner
Admiral Zavolko [1]	RNZ	125	Admins. of Province of Kamchatka	300, 600	P G	0800 to 0900 1500 to 1600 2200 to 2300	0.40	—	[2] Provisionally
Afon [1]	RPA	450	Cie Russe de Nav. à Vap. et de Comm.	300, 600	P G	1200 to 1400 1800 to 2000 0200 to 0400	0.40 [5]	—	[3] Also in emergency at any time of day or night
Aleksandria	RFI	—	Navy	—	O	—	—	—	[4] Station is open during first and last fifteen minutes of each hour from 0800 to 2200
Almaz	RKU	—	Navy	—	O	—	—	—	[5] Ship charge is reduced to 13 centimes per word for correspondence with Russian coast and ship stations
Amour	RGP	—	Navy	—	O	—	—	—	
Anadyr	RJS	—	Navy	—	O	—	—	—	
Andrei Pervozvannyi	RGB	—	Navy	—	O	—	—	—	
Angara	RIB	—	Navy	—	O	—	—	—	
Askold	RMA	—	Navy	—	O	—	—	—	
Astrakhan RON [1]	RON	Day 100 Night 250	Volunteer Fleet	300, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Avrora	RGO	—	Navy	—	O	—	—	—	
Baian	RGJ	—	Navy	—	O	—	—	—	
Berezan	RKZ	—	Navy	—	O	—	—	—	
Bobr	RGW	—	Navy	—	O	—	—	—	
Bogatyr	RGM	—	Navy	—	O	—	—	—	
Cherson [1]	RNJ	250	Volunteer Fleet	300, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Dobrovolets	RHO	—	Navy	—	O	—	—	—	
Donetz	RKO	—	Navy	—	O	—	—	—	
Donskoi Kazak	RHW	—	Navy	—	O	—	—	—	
Dounaii	RKW	—	Navy	—	O	—	—	—	
Eclips [1]	REE	430	Department of Marine	300, 600, 900	P	X	0.40 [5]	—	
Ekatérinoslav RNH [1]	RNH	250	Volunteer Fleet	300, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
						Time of Petrograd	Francs.	Francs.	
RUSSIA—*contd.*									
Emir Boukharskii ..	RHK	—	Navy	—	O ..	—	—	—	
Ennissey	RG	—	Navy	—	O ..	—	—	—	
Erivan RNQ [1] ..	RNQ	350	Volunteer Fleet	300, **600**	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Euphrate RPD [1] ..	RPD	450	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G ..	0200 to 0400 1200 to 1400 1800 to 2000 [8]	0.40 [5]	—	
Evstafii	RKA	—	Navy	—	O ..	—	—	—	
Finn	RHL	—	Navy	—	O ..	—	—	—	
Gaïdamak	RHQ	—	Navy	—	O ..	—	—	—	
General Kondratienko	RHC	—	Navy	—	O ..	—	—	—	
Gheorgii Pobedonosetz	RKI	—	Navy	—	O ..	—	—	—	
Gromoboi	RGI	—	Navy	—	O ..	—	—	—	
Guiliak	RGZ	—	Navy	—	O ..	—	—	—	
Herta [1]	RHE	430	Department of Marine	300, **600**, 900	P ..	X	0.40 [5]	—	
Iaroslavl [1]	RNO	250	Volunteer Fleet	300, **600**	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Imperator Alexandre III [1]	RPU	450	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G ..	0200 to 0400 1200 to 1400 1800 to 2000	0.40 [5]	—	
Imperator Nicolaï [1] ..	RPM	450	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G ..	0200 to 0400 1200 to 1400 1800 to 2000	0.40 [5]	—	
Imperator Nicolaï II [1]	RPB	450	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G ..	0200 to 0400 1200 to 1400 1800 to 2000	0.40 [5]	—	
Imperator Pavel I ..	RGC	—	Navy	—	O ..	—	—	—	
Ioann Zlatooust ..	RKC	—	Navy	—	O ..	—	—	—	
Irtych [1]	ROJ	60	Volunteer Fleet	300, **600**	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Jérusalem [1]	RPI	450	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G ..	0200 to 0400 [8] 1200 to 1400 1800 to 2400	0.40 [5]	—	
Kagoul	RKM	—	Navy	—	O ..	—	—	—	
Kama	[illegible]	—	Navy	—	O ..	—	—	—	

Kamenetz-Podolsk ROP [1]	ROP	170	Volunteer Fleet	300, 600	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Kapitan Leitenant Baranoff	RLE	—	Navy	—	O ..	—	—	—
Kapitan Saken ..	RLC	—	Navy	—	O ..	—	—	—
Kazanets	RHU	—	Navy	—	O ..	—	—	—
Khrabryi	RGU	—	Navy	—	O ..	—	—	—
Kiev [1]	RNK	250	Volunteer Fleet	300, 600	P [2] ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Kishinev [1]	RNC	250	Volunteer Fleet	300, 600	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Kolyma [1]	ROG	Day 100 Night 200	Volunteer Fleet	300, 600	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Koreets	RGV	—	Navy	—	O ..	—	—	—
Koroléva Olga [1] ..	RPL	450	Cie Russe de Nav. à Vap. et de Comm.	300, 600	P G ..	0200 to 0400 1200 to 1400 1800 to 2000	0.40 [5]	—
Koubanetz	RKS	—	Navy	—	O ..	—	—	—
Koursk RNY [1]	RNY	250	Volunteer Fleet	300, 600	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Koursk RSK [1] ..	RSK	180	Cie Russe de Nav. à Vap. de l'Asie Orientale	300, 600	P G ..	N	0.40 [5]	—
Krasnoiarsk ROU [1] ..	ROU	160	Volunteer Fleet	300, 600	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Kronstadt	RKX	—	Navy	—	O ..	—	—	—
Lazareff [1]	RPW	—	Cie Russe de Nav. à Vap. et de Comm.	300, 600	P G ..	0200 to 1600 1200 to 1400 1800 to 2000	0.50	—
Leitenant Chestakoff	RLB	—	Navy	—	O ..	—	—	—
Leitenant Zatsarennyi	RLD	—	Navy	—	O ..	—	—	—
Mandjour	RMF	—	Navy	—	O ..	—	—	—
Mangougai	RME	—	Navy	—	O ..	—	—	—
Mezen	RIJ	—	Navy	—	O ..	—	—	—
Mitawa [1]	RSA	200	Cie Russe de Nav. à Vap. de l'Asie Orientale	300, 600	P G ..	N	0.40 [5]	—
Mohilev [1]	RNM	250	Volunteer Fleet	300, 600	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Moskvitianin	RHN	—	Navy	—	O ..	—	—	—
Neva RFF	RFF	—	Navy	—	O ..	—	—	—
Nijni-Novgorod [1] ..	RNE	250	Volunteer Fleet	300, 600	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Nikolaeff	RGT	—	Navy	—	O ..	—	—	—
Novgorod RNP [1] ..	RNP	250	Volunteer Fleet	300, 600	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Novik	RHA	—	Navy	—	O ..	—	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
						Time of Petrograd	Francs.	Francs.	
RUSSIA—*contd.*									
Odessa RPE [1]	RPE	450	Cie Russe de Nav. à Vap et de Comm.	300, **600**	P G	0200 to 0400 1200 to 1400 1800 to 2000	0.40 [5]	—	
Oka	RIC	—	Navy	—	O	—	—	—	
Okean	RGR	—	Navy	—	O	—	—	—	
Okhotnik	RHF	—	Navy	—	O	—	—	—	
Oleg	RGN	—	Navy	—	O	—	—	—	
Omsk [1]	ROM	170	Volunteer Fleet	300, **600**	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Oukraina	RHT	—	Navy	—	O	—	—	—	
Ouraletz	RKP	—	Navy	—	O	—	—	—	
Oussouriets	RHR	—	Navy	—	O	—	—	—	
Oussourri	RMD	—	Navy	—	O	—	—	—	
Pallada	RGS	—	Navy	—	O	—	—	—	
Pamiat Merkaouria	RKL	—	Navy	—	O	—	—	—	
Panteleimon	RKD	—	Navy	—	O	—	—	—	
Pechora	RIE	—	Navy	—	O	—	—	—	
Penza [1]	RSZ	250	Volunteer Fleet	300, **600**	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Piotre Véliki [1]	RPR	110	Committee of Riga Stock Exch...	300, **600**	P G	— [4]	0.40	—	
Pogranitchnik	RHI	—	Navy	—	O	—	—	—	
Polezny [1]	RPZ	100	Cie Russe de Nav. à Vap et de Comm.	300, **600**	P G	0200 to 0400 [3] 1200 to 1400 1800 to 2000	0.40 [5]	—	
Poliarnaya Zviezda	RFD	—	Navy	—	O	—	—	—	
Poltava [1]	RST	250	Volunteer Fleet	300, **600**	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Prinzessa Evguénia Oldenbourgskaia [1]	RPH	300	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G	0200 to 0400 1200 to 1400 1800 to 2000	0.40 [5]	—	
Prout	RKV	—	Navy	—	O	—	—	—	
Riga	RIK	—	Navy	—	O	—	—	—	
Rossia RGL	RGL	—	Navy	—	O	—	—	—	
Rossia RSR [1]	RSR	200	Cie Russe de Nav. à Vap. de l'Asie Orientale	300, **600**	P G	N	0.40 [5]	—	
Rostislav	RKF	—	Navy	—	O	—	—	—	

Rurik	RGA	—	Navy	—	O	—	—	—
Sibirskii strelok	RHB	—	Navy	—	O	—	—	—
Sichan [1]	ROB	Day 100 Night 200	Volunteer Fleet	300, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Simbirsk [1]	ROC	Day 100 Night 250	Volunteer Fleet	300, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Simferopo [4]	RSP	250	Volunteer Fleet	300, 600, 900	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Sinop	RKG	—	Navy	—	O	—	—	—
Sivouch	RGX	—	Navy	—	O	—	—	—
Slava	RGH	—	Navy	—	O	—	—	—
Smieliy [1]	RSM	—	Cie Russe de Nav. à Vap. et de Comm.	300	P G	0200 to 0400 1200 to 1400 1800 to 2000	0.50	—
Soukhona	RIG	—	Navy	—	O	—	—	—
Soutchan [1]	ROS	60	Volunteer Fleet	300, 450, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Ssaratov [1]	RNG	250	Volunteer Fleet	300, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Standart	RFB	—	Navy	—	O	—	—	—
Stavropol [1]	RNS	100	Volunteer Fleet	300, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Steregouchtii	RHZ	—	Navy	—	O	—	—	—
Strachnyl	RHV	—	Navy	—	O	—	—	—
Stréla	RFG	—	Navy	—	O	—	—	—
Sviatoi Nicolai [1]	RPX	300	Cie Russe de Nav. à Vap. et de Comm.	300 600	P G	0200 to 0400 [2] 1200 to 1400 1800 to 2000	0.40 [5]	—
Taimir	RMH	—	Navy	—	O	—	—	—
Tambov RNW [1]	RNW	250	Volunteer Fleet	300, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Tchikhatcheff [1]	RPC	450	Cie Russe de Nav. à Vap. et de Comm.	300, 600	P G	0200 to 0400 1200 to 1400 1800 to 2000	0.40 [5]	—
Teretz	RKT	—	Navy	—	O	—	—	—
Tigre [1]	RPT	450	Cie Russe de Nav. à Vap. et de Comm.	300, 600	P G	0200 to 0400 [2] 1200 to 1400 1800 to 2000	0.40 [5]	—
Tobol [1]	ROV	430	Volunteer Fleet	300, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Tobolsk [1]	ROQ	Day 100 Night 250	Volunteer Fleet	300, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—
Tomsk [1]	ROF	Day 100 Night 250	Volunteer Fleet	300, 600	P G	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
						Time of Petrograd	Francs.	Francs.	
RUSSIA—*contd.*									
Toula [1]	RNB	250	Volunteer Fleet	300, **600**	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Tourkmen Stavropolskii	RHS	—	Navy	—	O ..	—	—	—	
Tri Sviatitelia ..	RKE	—	Navy	—	O ..	—	—	—	
Tsar [1]	RSC	160	Cie Russe de Nav. à Vap. de l'Asie Orientale	300, **600**	P G ..	N	0.40 [5]	—	
Tsar Mikhall Féodorovitch [1]	RPV	450	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G ..	0200 to 0400 1200 to 1400 1800 to 2000	0.40 [5]	—	
Tsesarevitch	RGF	—	Navy	—	O ..	—	—	—	
Tséssarevitch Aléxey Nikolaievitch [1]	RPY	300	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G ..	0200 to 0400 1200 to 1400 1800 to 2000	0.40 [5]	—	
Tséssarévitch Gueorgui[1]	RPF	300	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G ..	0200 to 0400 [3] 1200 to 1400 1800 to 2000	0.40 [5]	—	
Turgal [1]	ROH	170	Volunteer Fleet	300, **600**	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Tver [1]	RNT	210	Volunteer Fleet	300, **600**	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Vaiguatch	RML	—	Navy	—	O ..	—	—	—	
Vélikala - Kniaguinia-Xénia [1]	RPG	300	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G ..	0200 to 0400 [3] 1200 to 1400 1800 to 2000	0.40 [5]	—	
Velikala Kniaguinia Xénia Alexandrovna	ROD	300	Commercial Nav. School, Odessa	300, **600**	P G ..	1400 to 1500 2000 to 2100	—	—	
Vélikaia Kniajna Maria Nikolaievna	RNI	200	Volunteer Fleet Training Ship ..	**600**	P ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Véliki-Kniaz Alexii [1] ..	RPQ	300	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G ..	0200 to 0400 1200 to 1400 1800 to 2000	0.40 [5]	—	
Véliki Kniaz Constantine [1]	RPO	300	Cie Russe de Nav. à Vap. et de Comm.	300, **600**	P G ..	0200 to 0400 1200 to 1400 1800 to 2000	0.40 [5]	—	

Name	Call	Power	Owner	Wavelengths	Service	Hours	Rate	Rate	Remarks
Vladimir [1]	RNV	250	Volunteer Fleet	300, 600	P G .	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Volskovol	RIA	—	Navy	—	O ..	—	—	—	
Vologda RND [1] ..	RND	170	Volunteer Fleet	300, 600	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Voronège [1]	RNX	250	Volunteer Fleet	300, 600	P G ..	0800 to 1000 1300 to 1600 2000 to 2400	0.40 [5]	—	
Vsadnik	RHP	—	Navy	—	O ..	—	—	—	
Zabaikalets	RHX	—	Navy	—	O ..	—	—	—	
Zemtchoug	RMB	—	Navy	—	O ..	—	—	—	
SAINT LUCIA									
Genesee ZES [1]	ZES	—	Everett and Newbiggin	300, 600	P G ..	X	0.40	—	[1] Operated by the Marconi International Marine Communication Co., Ltd.
SIAM									
Bali HGC	HGC	—	Government	300, 600	O ..	—	—	—	
Sua Kamrensindhu ..	HGE	—	Government	300, 600	O ..	—	—	—	
Sua Tayanchol	HGD	—	Government	300, 600	O ..	—	—	—	
SOUTH AFRICA (UNION OF)									
Africshore	VNL	—	British Africa Shipp'g & Coaling Co	—	P ..	X	0.40		
Apolda	CGZ	—	—	—	—	—	—	—	
Ludwig Wiener ..	VNA	100	Government	300, 600	O ..	—	—	—	
Sir David Hunter ..	VNH	Day 240 Night 800	Government	600	O ..	—	—	—	
S. Africa	VNS	Day 240 Night 800	Cape Explosives, Ltd.	300, 600	P ..	X	0.40	—	
Miramichi . ..	—	—	S. African S.N. Co.	—	—	—	—	—	
SPAIN									
Achuri [3]	HNB	150	Cia Maritima Bilbao	300, 600	P G ..	N	0.30	3.00	[1] Wireless apparatus is property of the shipowners, but operated by Cia Nac. de Telegrafia sin Hilos
Adelina [3]	EDF	150	Cia Barcelonesa de Naveg. ..	300, 600	P G ..	N	0.30	3.00	[2] Wireless apparatus is operated and controlled by Cia Nac. de Telegrafia sin Hilos
Adolfo [3]	EEY	200	Soc. Naviera "Elcano"	300, 600	P G ..	N	0.30	3.00	[3] Operated by the owner
Agadir TNC [3]	TNC	150	Echevarrieta Larrinaga	300, 600	P G ..	N	0.30	3.00	[4] Operated by the Cia
Agustin [4]	TLV	150	Agustin Mutiozabal	300, 600	P G ..	N	0.30	3.00	
Agustina Forner [2] ..	HLH	200	Primo Redó	300, 600	P G ..	N	0.30	3.00	
Aizkori Mendi [2] ..	HMF	150	Cia Naviera Sota y Aznar ..	300, 600	P G ..	N	0.30	3.00	
Alava [2]	CMS	100	Cia Naviera Mundaca	300, 600	P G ..	N	0.30	3.00	
A. Lazaro [2]	EEL	180	Cia Trasmediterranea	300, 600	P G ..	N	0.30	3.00	
Albal [2]	CMW	150	Cia Espanola de Naveg. S.A. ..	300, 600	P G ..	N	0.30	3.00	
Alberto [2]	TIA	100	Drala y Agalde	300, 600	P G ..	N	0.30	3.00	
Alfonso XII. [2]	EDD	269	Cia Transatlantica	300, 600	P G ..	N	0.30	3.00	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
SPAIN—*contd.*									
Alfonso XIII. EBB	EBB	550	Navy	—	O	—	—	—	Nac. de Telegrafia sin Hilos, Madrid, on account of the Soc. Anonyme Internationale de Telegraphie sans fils, Brussels
Alfonso XIII. EDT [2]	EDT	269	Cia Transatlantica	300, **600**	P G	N	0.30	3.00	
Alfonso XIII TOB [4]	TOB	930	Compania Transatlantica	300, **600**	P G	N	0.30	3.00	
Alfonso Perez [2]	TLH	150	Angel F. Perez	300, **600**	P G	N	0.30	3.00	
Alfredo [4]	TLU	150	Hijos de J. Taya, Barcelona	300, **600**	P G	N	0.30	3.00	
Algortenõ [2]	CMB	100	Cia Minera de Villaodrid	300, **600**	P G	N	0.30	3.00	
Alicante [2]	EDA	269	Cia Transatlantica	300, **600**	P G	N	0.30	3.00	
Almirante Lobo	EBN	140	Navy	—	O	—	—	—	
Alu-Mendi [4]	TML	200	Sota y Aznar, Bilbao	300, **600**	P G	N	0.30	3.00	
Alvaro de Bazan	EBM	81	Navy	—	O	—	—	—	
Ampurdan [2]	HLZ	150	Hijos de Enrique Gir.	300, **600**	P G	N	0.30	3.00	
Andalucia [2]	EED	150	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
Andraka Mendi [2]	HMH	150	Cia Naviera Sota y Aznar	300, **600**	P G	N	0.30	3.00	
Angel B. Perez [2]	ECD	150	Don Carlos Latorre	300, **600**	P G	N	0.30	3.00	
Anita [2]	TLJ	200	Irala y Ugalde	300, **600**	P G	N	0.30	3.00	
Anorga [2]	HNS	100	Hijos de J. M. Rezola	300, **600**	P G	N	0.30	3.00	
Antonia Mumbrú [2]	CXA	150	Dom. Mumbrú	300, **600**	P G	N	0.30	3.00	
Antonio TMR [4]	TMR	100	Compañia Cantabrica, S. Sebastian	300, **600**	P G	N	0.30	3.00	
Antonio de Satrustegui	TNF	200	Compañia Navegacion Vasco-Asturiana	300, **600**	P G	N	0.30	3.00	
Antonio Lopez [2]	EDL	269	Cia Transatlantica	300, **600**	P G	N	0.30	3.00	
Apolo [2]	CMA	150	Cia Anonima Mar. Union	300, **600**	P G	N	0.30	3.00	
Aragon EEM [2]	EEM	150	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
Arantzazu [2]	HMJ	150	Cia de Navegation Bengolia	300, **600**	P G	N	0.30	3.00	
Arenas TIC [2]	TIC	150	Miguel F. Ferra	300, **600**	P G	N	0.30	3.00	
Arichachu [2]	TNG	200	Compañia Naviera Bermeo, Bilbao	300, **600**	P G	N	0.30	3.30	
Ariz-Mendi [4]	TLS	200	Sota y Aznar, Bilbao	300, **600**	P G	N	0.30	3.00	
Armando TID [2]	TID	100	Irala y Ugalde	300, **600**	P G	N	0.30	3.00	
Armuru [2]	HMU	150	Cia Nav. Vascongada	600	P G	N	0.30	3.00	
Arnabal Mendi [2]	HMI	100	Cia Naviera Sota y Aznar	300, **600**	P G	N	0.30	3.00	
Arno Mendi [2]	TIE	200	Cia Naviera Sota y Aznar	300, **600**	P G	N	0.30	3.00	
Arnotegi-Mendi [4]	TLY	200	Sota y Aznar	300, **600**	P G	N	0.30	3.00	
Arnus [2]	HNC	250	Cia de Tabacos de Filipianos	300, **600**	P G	N	0.30	3.00	
Arraiz [2]	TIF	500	Cia Nav. Vascongada	300, **600**	P G	N	0.30	3.00	
Arriluze [2]	ECG	150	Soc. Minera de Villaodrid	300, **600**	P G	N	0.30	3.00	
Artigan Mendi [2]	CXU	200	Cia Nav. Sota y Aznar	300, **600**	P G	N	0.30	3.00	
Artxanda-Mendi [4]	TLX	200	Sota y Aznar	300, **600**	P G	N	0.30	3.00	
Arza-Mendi [4]	TLR	200	Sota y Aznar	300, **600**	P G	N	0.30	3.00	
Astondo Mendi [2]	HMK	100	Cia Nav. Sota y Aznar	300, **600**	P G	N	0.30	3.00	

Atlante EFA [1]	EFA	150	Cia Trasmediterranea	300, 600	P G	..	N	0.30	3.00
Atxeri-Mendi [4]	TMK	200	Sota y Aznar, Bilbao	300, 600	P G	..	N	0.30	3.00
Aviles [3]	HNO	150	—	300, 600	P G	..	N	0.30	3.00
Audaz	EHQ	—	Navy	—	O	..	—	—	—
Auxias March [1]	EEA	150	Cia Trasmediterranea	300, 600	P G	..	N	0.30	3.00
Azpeitia [2]	HNI	150	Cia de Nav. Bengolea	300, 600	P G	..	N	0.30	3.00
Bachi [2]	TIG	200	Cia Nav. Bachi	300, 600	P G	..	N	0.30	3.00
Balear [3]	EFR	100	Cia Isleña Mar.	300, 600	P G	..	N	0.30	3.00
Balmes [2]	ECA	275	Pinillos Izquierdo y Cia	300, 600	P G	..	N	0.30	3.00
Banana [2]	TIH	100	Garrigos é Hijos	300, 600	P G	..	N	0.30	3.00
Banderas [3]	TII	500	Cia Nav. Vascongada	300, 000	P G	..	N	0.30	3.00
Bara-bi [2]	TIJ	150	Cia Nav. Baracalda	300, 600	P G	..	N	0.30	3.00
Baracaldo [3]	TIK	100	Luis Hermigo	300, 600	P G	..	N	0.30	3.00
Barcelo [1]	EEB	180	Cia Trasmediterranea	300, 600	P G	..	N	0.30	3.00
Barcelona [2]	ECB	300	Pinillos Izquierdo y Cia	300, 600	P G	..	N	0.30	3.00
Bartolo [2]	CMT	150	Cia Navieri Bachi	300, 600	P G	..	N	0.30	3.00
Basconia [2]	HLB	100	Zalbide y Zulaica	300, 600	P G	..	N	0.30	3.00
Begonia No. 1 [2]	HLN	150	Luis Ibran	300, 600	P G	..	N	0.30	3.00
Begonia No. 2 [2]	HLQ	150	José Maria Urquijo	300, 600	P G	..	N	0.30	3.00
Begonia No. 3 [2]	HLX	200	José Maria Urquijo	300, 600	P G	..	N	0.30	3.00
Begonia No. 4 [2]	CMV	150	José Maria Urquijo	300, 600	P G	..	N	0.30	3.00
Begonia No. 5	HNE	150	José Maria Urquijo	300, 600	P G	..	N	0.30	3.00
Beliver [3]	EFB	200	Cia Islena Maritima	300, 600	P G	..	N	0.30	3.00
Berja [4]	TIQ	100	Soc. Anon. Nav. Española, Barcelona	300, 600	P G	..	N	0.30	3.00
Bermeo [2]	TIL	100	Cia Nov. Bermes	300, 600	P G	..	N	0.30	3.00
Bilbaino [2]	HMC	100	Garrigos é Hijos	300, 600	P G	..	N	0.30	3.00
Betis [2]	TIM	100	Cia Espag de Navegacion	300, 600	P G	..	N	0.30	3.00
Biskargi Mendi [3]	HMN	150	Cia Naviera Sota y Aznar	300, 600	P G	..	N	0.30	3.00
Blas de Lezo [2]	TIN	100	José Maria Caballero	300, 600	P G	..	N	0.30	3.00
Bonifaz	EBR	220	Navy	—	O	..	—	—	—
Buenos Aires EDB [3]	EDB	269	Cia Trasatlantica	300, 600	P G	..	N	0.30	3.00
Bustamante	EBO	140	Navy	—	O	..	—	—	—
Cabanal [1]	EEC	180	Cia Trasmediterranea	300, 600	P G	..	N	0.30	3.00
Cabo Carvoeira [2]	CXS	150	Ibarra y Compania	300, 600	P G	..	N	0.30	3.00
Cabo Cervera [2]	ECU	250	Ibarra y Compania	300, 600	P G	..	N	0.30	3.00
Cabo Creus [3]	TIO	500	Ibarra y Compania	300, 600	P G	..	N	0.30	3.00
Cabo Espartel [2]	HLU	150	Ibarra y Compania	300, 600	P G	..	N	0.30	3.00
Cabo Huertas [4]	TMH	150	Ibarra y Compañia, Sevilla	300, 600	P G	..	N	0.30	3.00
Cabo Menor [2]	CXM	150	Ibarra y Compania	300, 600	P G	..	N	0.30	3.00
Cabo Ortegal [2]	HLA	150	Ibarra y Cia	300, 600	P G	..	N	0.30	3.00
Cabo Razo [4]	TMG	150	Ibarra y Compañia, Sevilla	300, 600	P G	..	N	0.30	3.00
Cabo Roche [4]	TMI	150	Ibarra y Compañia, Sevilla	300, 600	P G	..	N	0.30	3.00
Cabo Socratif [1]	HNN	150	Ibarra y Compania	300, 600	P G	..	N	0.30	3.00
Cabo tres Forcas [3]	ECK	150	Ibarra y Compania	300, 600	P G	..	N	0.30	3.00
Cabo Villano [2]	HLL	150	Ibarra y Cia	300, 600	P G	..	N	0.30	3.00
Cadarso	EBQ	14	Navy	—	O	..	—	—	3.00
Cadiz [2]	ECC	300	Pinillos Izquiero y Cia	300, 600	P G	..	N	0.30	3.00
Camproa [2]	CXC	100	Figueroa y Campos	300, 600	P G	..	N	0.30	3.00
Canalejas [1]	EEK	100	Cia Trasmediterranea	300, 600	P G	..	N	0.30	3.00
Capita Revuelta [2]	HNQ	150	Hijos de J. Taya	300, 600	P G	..	N	0.30	3.00
Capitan Segarra [2]	HMG	250	Cia Trasmediterranea	300, 600	P G	..	N	0.30	3.00
Carlos V	EBE	500	Navy	—	O	..	—	—	—
Carolina E. De Perez [2]	ECF	150	Don Angel F. Perez	300, 600	P G	..	N	0.30	3.00
Castilla [1]	EEQ	150	Cia Trasmedit rranea	300, 600	P G	..	N	0.30	3.00
Castro Alen [3]	TIP	150	Cia Iberica de Tel.	300, 600	P G	..	N	0.30	3.00

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
SPAIN—*contd.*							Francs.	Francs.	
Catalina [2]	ECT	300	Pinillos Izquierdo y Cia	300, **600**	P G	N	0.30	3.00	
Cataluna EDC [2]	EDC	108	Cia Transatlantica	300, **600**	P G	N	0.30	3.00	
Cataluna EEU [2]	EEU	150	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
Cataluna EBF	EBF	216	Navy	—	O	—	—	—	
Cataluna EFC [2]	EFC	100	Cia Islena Mar.	300, **600**	P G	N	0.30	3.00	
Chivichiaga [2]	TNA	150	Compania Naviera Bermeo, Bilbao	300, **600**	P G	N	0.30	3.00	
Christobal Colon [4]	TOC	930	Compañia Transatlantica	300, **600**	P G	N	0.30	3.00	
Ciervana [2]	TIR	150	Hijos de J. Taya	300, **600**	P G	N	0.30	3.00	
Cirilo Amoros [2]	HLC	150	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
Cisneros [2]	TNE	100	Manuel Lopez Madrid, Barcelona	300, **600**	P G	N	0.30	3.00	
Ciudad de Cadiz [2]	EDZ	108	Cia Trasatlantica	300, **600**	P G	N	0.30	3.00	
Claudio [2]	CMK	100	Cia Naviera Euzkera	300, **600**	P G	N	0.30	3.00	
C. Lopez y Lopez	EDH	269	Cia Trasatlantica	300, **600**	P G	N	0.30	3.00	
Concha [2]	HMA	100	Ricardo Ort z Artinano	300, **600**	P G	N	0.30	3.00	
Conde de Abasolo [2]	TIS	200	Cia Naviera Vascongada	300, **600**	P G	N	0.30	3.00	
Conde de Zubiria [2]	CMZ	150	Altos Ornos de Vizaya	300, **600**	P G	N	0.30	3.00	
Conde Wifredo [2]	ECW	300	Pinillos Izquierdo y Cia	300, **600**	P G	N	0.30	3.00	
Consuelo [2]	TLK	150	Ricardo Ortiz Artinano	300, **600**	P G	N	0.30	3.00	
Coria [4]	TMN	150	Naviera Sevillana S.A., Sevilla	300, **600**	P G	N	0.30	3.00	
Cosme y Jacinta [2]	TIT	500	Echevarreta Larinaga	300, **600**	P G	N	0.30	3.00	
Cresalubi [2]	HMD	100	Cia de Nav. Bengolea	300, **600**	P G	N	0.30	3.00	
Cristina Rueda [2]	TIU	100	Garrigos é Hijos	300, **600**	P G	N	0.30	3.00	
Cristobal Llusa [2]	TIV	100	Viuda de Llusa y R. Masia	300, **600**	P G	N	0.30	3.00	
Delfin CLD	CLD	—	Navy	—	O	—	—	—	
Delfin EFD [2]	EFD	150	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
Delfina TOD [4]	TOD	200	Sainz é Inchaustegui, Bilbao	300, **600**	P G	N	0.30	3.00	
Domingo Mumbrú [4]	TMJ	150	Sociedad Anónima "Cros," Barcelona	300, **600**	P G	N	0.30	3.00	
Donato [2]	TIW	150	Cia de Comm. S. A.	300, **600**	P G	N	0.30	3.00	
Donastia [2]	HNJ	150	Cia Anonima de Nav.	300, **600**	P G	N	0.30	3.00	
Dorado	CLB	—	Navy	—	O	—	—	—	
Durango [2]	TIX	500	Cia Nav. Vascongada	300, **600**	P G	N	0.30	3.00	
Elanchove [2]	TLA	200	Cia Mar. Elanchove	300, **600**	P G	N	0.30	3.00	
Elcano TLD [2]	TLD	150	Compañia de Tabacos de Filipinas	300, **600**	P G	N	0.30	3.00	
Emilia S. De Perez [2]	ECE	300	A. F. Perez	300, **600**	P G	N	0.30	3.00	
Emperador Carlos V.	EBE	243	Navy	300, **750**	O	N	—	—	
Enrique Ballesteros [2]	CMN	150	Cia Maritima Ballesteros	300, **600**	P G	N	0.30	3.00	
Eolo [2]	CME	150	Cia Anonima Mar. Union	300, **600**	P G	N	0.30	3.00	

Eretza Mendi[2]	HMO	250	Cia Naviera Sota y Aznar	300, 600	P G	N	0.30	3.00
Escolano[2]	TIY	150	Cia Trasmediterranea	300, 600	P G	N	0.30	3.00
Espana	EBA	—	Navy	—	O	—	—	—
Espana No. 1[2]	TIZ	150						
Espana No. 2[2]	TJA	150						
Espana No. 3[2]	TJB	150	El Consejo de Admin. y Gerencia de los buques incaplarados por el Estado Espanol	300, 600	P G	N	0.30	3.00
Espana No. 4[1]	TJC	150						
Espana No. 5[2]	TJD	150						
Espana No. 6[1]	TJE	150						
Eugenio Dutrus[2]	TJZ	150	Dutrus y Carsi	300, 600	P G	N	0.30	3.00
Eusebia del Valle[4]	HMU	150	Julio Benito del Valle, Bilbao	300, 600	P G	N	0.30	3.00
Euzkera[2]	CMY	100	Cia Naviera Euzkera	300, 600	P G	N	0.30	3.00
Extremadura EBJ	EBJ	—	Navy	—	O	—	—	—
Faustino R. San Pedro[2]	CMD	150	Altos Hornos de Vizoaya	300, 600	P G	N	0.30	3.00
Felix TJF[2]	TJF	150	Suarez y Ulargui	300, 600	P G	N	0.30	3.00
Fernando L. de Ibarra	HMM	150	Altos Hornos de Vizcaya	300, 600	P G	N	0.30	3.00
Florentina[4]	TOE	150	Ildefonso G. Fierro, Oviedo	300, 600	P G	N	0.30	3.00
Florinda[2]	EDR	150	Cia Barcelonesa de Nav.	300, 600	P G	N	0.30	3.00
Fuerteventura[2]	EFY	150	Canary Interinsular Mail S.S. Co.	300, 600	P G	N	0.30	3.00
Galdames[2]	ECX	150	Cia Auxilier Marit. S.A.	300, 600	P G	N	0.30	3.00
Galea[2]	CXB	150	Cia Naviera Guipuzcoana	300, 600	P G	N	0.30	3.00
Gallo (El)	HLD	100	Alejandro Navajas	300, 600	P G	N	0.30	3.00
Gaviota CLF	CLF	—	Navy	—	O	—	—	—
Gelves[4]	TMO	150	Naviera Sevillana S.A., Sevilla	300, 600	P G	N	0.30	3.00
Gen. Fernandez Silvestre[1]	EEN	120	Cia Trasmediterranea	300, 600	P G	N	0.30	3.00
Giralda	EBI	—	Government	—	O	—	—	—
Gloria[2]	TJG	500	Cia Nav. Vascongada	300, 600	P G	N	0.30	3.00
Goizeko-Izarra[2]	TJH	100	Sota y Aznar Cia	300, 600	P G	N	0.30	3.00
Gorbea Mendi[2]	HMP	150	Cia Nav. Sota y Aznar	300, 600	P G	N	0.30	3.00
Grao[1]	EEG	100	Cia Trasmediterranea	300, 600	P G	N	0.30	3.00
Guadiamar[4]	TMV	200	Naviera Guadalquivir, S.A., Sevilla	300, 600	P G	N	0.30	3.00
Guernica[4]	TLT	150	Compania Auxiliar Maritima, Bilbao	300, 600	P G	N	0.30	3.00
Guillermo[2]	TJI	200	Wenceslas Gonzales Garra	300, 600	P G	N	0.30	3.00
Guipuzcoa[2]	CXZ	150	Cia Nav. Mundaca	300, 600	P G	N	0.30	3.00
Hamlin TMM[4]	TMM	200	Manuel Allende, Bilbao	300, 600	P G	N	0.30	3.00
Hercules[2]	CMH	150	Cia Anonima Mar. Union	300, 600	P G	N	0.30	3.00
Hernan Cortés	EHT	—	Navy	—	O	—	—	—
Hesperides[1]	EFH	300	Cia Trasmediterranea	300, 600	P G	N	0.30	3.00
Ibai Aurre[2]	CXK	100	Cia Maritima Ibai	300, 600	P G	N	0.30	3.00
Ibai Luze[2]	CXI	100	Cia Maritima Ibai	300, 600	P G	N	0.30	3.00
Ibai Patxo[2]	HMZ	100	Cia Maritima Ibai	300, 600	P G	N	0.30	3.00
Ibaizabal[2]	HLI	100	Hernandez Mendirichagay Cia	300, 600	P G	N	0.30	3.00
Ignacio[4]	TMB	200	Jose A. de Mutiozabal, Bilbao	300, 600	P G	N	0.30	3.00
Igotz-Mendi[2]	HMQ	250	Cia Naviera Sota y Aznar	300, 600	P G	N	0.30	3.00
Igualada	TJK	150	Cia Anon Espanola	300, 600	P G	N	0.30	3.00
Iluntzar-Mendi[2]	HMR	150	Cia Naviera Sota y Aznar	300, 600	P G	N	0.30	3.00
Ines ECI[2]	ECI	150	Soc. Naviera Elcano	300, 600	P G	N	0.30	3.00
Infanta Isabel ECY[2]	ECY	300	Pinillos Izquierdo y Cia	300, 600	P G	N	0.30	3.00
Infanta Isabel EBL	EBL	216	Navy	—	O	—	—	—
Infanta Isabel de Borbon[2]	EDI	430	Cia Trasatlantica	300, 600	P G	N	0.30	3.00

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
SPAIN—*contd.*							Francs.	Francs.	
Isaac Peral	EHP	—	Navy	—	O	—	—	—	
Isabel de Llusa [2]	TJJ	100	Vinda de Llusa	300, **600**	P G	N	0.30	3.00	
Isla de Menorca [3]	EFO	100	Cia Islena Mar.	300, **600**	P G	N	0.30	3.00	
Isla de Panay [2]	EDP	269	Cia Trasatlantica	300, **600**	P G	N	0.30	3.00	
Isleno [3]	EFI	100	Cia Islena Mar.	300, **600**	P G	N	0.30	3.00	
Iturri-Aurre [2]	CXK	100	Compania Naviera Iturri	300, **600**	P G	N	0.30	3.00	
Iturri-Azkar [2]	CMI	150	Cia Nav. "Iturri"	300, **600**	P G	N	0.30	3.00	
Iturri-Ederra [2]	HLE	150	Cia Nav. "Iturri"	300, **600**	P G	N	0.30	3.00	
Iturri-Gorri [2]	HLG	150	Cia Nav. "Iturri"	300, **600**	P G	N	0.30	3.00	
Iturri-Luze [2]	CXI	100	Compañia Naviera Iturri	300, **600**	P G	N	0.30	3.00	
Iturri-Paxto [2]	HMZ	100	Compañia Naviera Iturri	300, **600**	P G	N	0.30	3.00	
Iturri Urdina [2]	TJL	100	Cia Nav. "Iturri"	300, **600**	P G	N	0.30	3.00	
Jacinto Verdaguer [2]	EEV	—	Cia Trasmediterranea	300, **600**	P G	—	0.30	3.00	
Jaime Girona [2]	ECJ	250	Altos Ornos de Vizcaya	300, **600**	P G	X	0.30	3.00	
Jaime I	EBC	550	Navy	—	O	—	—	—	
Jaime Jerona [2]	ECJ	250	Altos Hornos de Bizcaya	300, **600**	P G	N	0.30	3.00	
Jata Mendi	HMS	200	Cia Nav. Sota y Aznar	300, **600**	P G	N	0.30	3.00	
Jatiba [1]	EEI	100	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
Jaume d'Urgell [2]	EFZ	150	Hijos de Jose Taya	300, **600**	P G	N	0.30	3.00	
J. B. Llevera [1]	EEH	100	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
J. C. Llusa [2]	TJM	100	Viuda de Llusa y R. Masia	300, **600**	P G	N	0.30	3.00	
Jeronimo Ibram [2]	TLI	150	Luis Ibran	300, **600**	P G	N	0.30	3.00	
Joaquin Pujol [2]	TJN	100	Antonio Pujol	300, **600**	P G	N	0.30	3.00	
Jorge Juan [1]	EEJ	180	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
José Estruch [4]	TOF	100	José Ateinza, Bilbao	300, **600**	P G	N	0.30	3.00	
Josefa TMS [4]	TMS	100	Compania Cantabrica, S. Sebastian	300, **600**	P G	N	0.30	3.00	
José Taya [2]	HNR	150	Hijos de J. Taya	300, **600**	P G	N	0.30	3.00	
José Villalonga [2]	CMF	250	Altos Hornos de Viscaya	300, **600**	P G	N	0.30	3.00	
J. S. Sister [1]	EES	180	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
Juan Maragall [2]	HLJ	150	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
Juliana [2]	EDX	150	Cia Barcelonesa de Nav.	300, **600**	P G	N	0.30	3.00	
Junio [2]	CMU	100	Cia Nav. Varacaldesa	300, **600**	P G	N	0.30	3.00	
Jupiter CMJ [2]	CMJ	150	Cia Anonima Marit. Union	300, **600**	P G	N	0.30	3.00	
J. Verdagner [2]	EEV	150	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
Kanguro	CNL	150	Navy	300, **600**	O	—	—	—	
Lauria	EBS	220	Navy	—	O	—	—	—	
Laya	EBT	220	Navy	—	O	—	—	—	
Legazpi [2]	EDG	269	Cia Trasatlantica	300, **600**	P G	N	0.30	3.00	
Leon XIII [2]	EDO	430	Cia Trasatlantica	300, **600**	P G	N	0.30	3.00	

Leonita[4]	TMC	200	Jose Luis de Ansoleaga, Bilbao	300, 600	P G	N	0.30	3.00
Leonora[2]	CXJ	150	El Naviero Domingo Numbru	300, 600	P G	N	0.30	3.00
Lily	TJO	150	Martinez Rivas	300, 600	P G	N	0.30	3.00
Lolin[2]	TLL	150	Campañia Naviera Bereincua	300, 600	P G	N	0.30	3.00
Luis Casanova[2]	TJQ	150	Viuda e Hijos de Luis Casanova	300, 600	P G	N	0.30	3.00
Lulio[2]	EFL	100	Cia Islena Mar.	300, 600	P G	N	0.30	3.00
Macarena[2]	HML	150	Don W. Gonzalez Garra	300, 600	P G	N	0.30	3.00
Madrid TJR[2]	TJR	150	Figueroa y Campos	300, 600	P G	N	0.30	3.00
Mahon[2]	EFN	150	Cia Islena Mar.	300, 600	P G	N	0.30	3.00
Maliano[2]	TLE	150	Doriga y Casuso	300, 600	P G	N	0.30	3.00
Mallorca[2]	EFK	200	Cia Islena Mar.	300, 600	P G	N	0.30	3.00
Manola[2]	TJP	100	Irala y Compañia	300, 600	P G	N	0.30	3.00
Manu[2]	TJS	200	Cia Nav. Amaya	300, 600	P G	N	0.30	3.00
Manuchu[4]	TMZ	200	Compañia Naviera Bachi, Bilbao	300, 600	P G	N	0.30	3.00
Manuela Pla[2]	CXP	150	Cia de Nav. Fabregas y garcia	300, 600	P G	N	0.30	3.00
Manuel Arnus[4]	TOA	930	Compañia Transatlantica	300, 600	P G	N	0.30	3.00
Manuel Calvo[2]	EDM	269	Cia Trasatlantica	300, 600	P G	N	0.30	3.00
Manuel Carsi[2]	TLC	200	Dutrus y Carsi	300, 600	P G	N	0.30	3.00
Manuel Opaliw[2]	CXE	150	Cia de Nav. Fabregas y garcia	300, 600	P G	N	0.30	3.00
Mar Adriatico[2]	TJT	200	Cia Mar. del Nervion	300, 600	P G	N	—	—
Mar Azoff[2]	TLP	200	Compañia Maritima del Nervion	300, 600	P G	N	0.30	3.00
Mar Blanco[2]	TJU	200	Cia Mar. del Nervion	300, 600	P G	N	0.30	3.00
Mar Cantabrico[2]	CXR	150	Cia Marit. del Nervion	300, 600	P G	N	0.30	3.00
Mar Caribe[2]	TJV	200	Cia Marit. del Nervion	300, 600	P G	N	0.30	3.00
Mar Caspio[2]	EFG	200	Cia Marit. del Nervion	300, 600	P G	N	0.30	3.00
Mar de Irlanda[4]	TMF	150	Compañia Maritima del Nervion, Bilbao	300, 600	P G	N	0.30	3.00
Mar del Norte[2]	CXF	150	Cia Marit. del Nervion	300, 600	P G	N	0.30	3.00
Mar del Plata	TJW	150	Cia Marit. del Nervion	300, 600	P G	N	0.30	3.00
Margari[2]	TJX	200	Cia Naviera Amaya	300, 600	P G	N	0.30	3.00
Maria de Molina	EHW	—	Navy	—	O	—	—	—
Maria Elena[2]	TJY	100	Luis Liano y Cia	300, 600	P G	N	0.30	3.00
Maria Milagros[2]	CML	150	Ampuero, Zubiria y Cia	300, 600	P G	N	0.30	3.00
Mari-Tere[4]	TMX	100	Oyanguren y Gonzalez, Bilbao	300, 600	P G	N	0.30	3.00
Mar Mediterraneo[2]	CXH	150	Cia Marit. del Nervion	300, 600	P G	N	0.30	3.00
Mar Negro[2]	ECV	200	Cia Marit. del Nervion	300, 600	P G	N	0.30	3.00
M. Arnus[2]	HLM	150	Hijos de José Taya	300, 600	P G	N	0.30	3.00
Marques del Turia[2]	HLT	150	Cia Trasmedi erranea	300, 600	P G	N	0.30	3.00
Marques de Campo[2]	CXW	150	Cia Trasmediterranea	300, 600	P G	N	0.30	3.00
Marques de Chavarri[2]	HLW	150	Altos Hornos de Vizcaya	300, 600	P G	N	0.30	3.00
Marques de Molins	EHU	—	Navy	—	O	—	—	—
Marques de Urquijo[2]	ECN	250	Altos Hornos de Vizcaya	300, 600	P G	N	0.30	3.00
Marques de la Victoria	EHV	—	Navy	—	O	N	—	—
Mar Rojo[2]	ECH	200	Cia Marit. del Nervion	300, 600	P G	N	0.30	3.00
Marte CMM[2]	CMM	150	Cia Anonima Marit. Union	300, 600	P G	N	0.30	3.00
Martin Saenz[2]	ECZ	300	Pinillos Izquierdo y Cia	300, 600	P G	N	0.30	3.00
Mar Tirreno[2]	ECM	150	Cia Marit. del Nervion	300, 600	P G	N	0.30	3.00
Marzo[2]	CMQ	100	Cia Bilbaina de Nav.	300, 600	P G	N	0.30	3.00
Menorquin[3]	EFQ	150	Cia Islena Maritima	300, 600	P G	N	0.30	3.00
Mercedes CXD[2]	CXD	100	Cia de Nav. Bengolea	300, 600	P G	N	0.30	3.00
Mercedes TLN[2]	TLN	200	Ricardo Ortiz Artinano	300, 600	P G	N	0.30	3.00
Mercurio[2]	TKA	150	Hijos de J. Barreras	300, 600	P G	N	0.30	3.00
M. L. Villaverde[2]	EDW	108	Cia Trasatlantica	300, 600	P G	N	0.30	3.00
M. M. Pinillos[2]	ECP	300	Pinillos Izquierdo y Cia	300, 600	P G	N	0.30	3.00
Mirentxu[1]	HMB	100	Federico Power	300, 600	P G	N	0.30	3.00

Ship Stations—*Continued*

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SPAIN—*contd.*							Francs.	Francs.	
Monte Toro [3]	EFT	150	Cia Islena Maritima	300, **600**	P G	N	0.30	3.00	
Montevideo EDV [2]	EDV	270	Cia Trasatlantica	300, **600**	P G	N	0.30	3.00	
Montserrat [2]	EDN	270	Cia Trasatlantica	300, **600**	P G	N	0.30	3.00	
Mouro [2]	ECO	180	Cia Vasco Cantabrica de Nav.	300, **600**	P G	N	0.30	3.00	
Navarra EDY [2]	EDY	100	Cia Naviera Mundaca	300, **600**	P G	N	0.30	3.00	
Navarra EEX [2]	EEX	100	Cia Trasmediterranea	300, **600**	P G	N	0.30	3.00	
Nautilus	EBV	—	Navy	—	O	—	—	—	
Nuri [2]	CMC	150	Cia Barcelonea de Nav.	300, **600**	P G	N	0.30	3.00	
Ogono [2]	CXG	100	Cia de Nav. La Blanca	300, **600**	P G	N	0.30	3.00	
Oiz [2]	CMP	150	Banco Urquijo, Madrid	300, **600**	P G	N	0.30	3.00	
Olavarria [2]	CMO	150	Cia Marit. del Nervion	300, **600**	P G	N	0.30	3.00	
Olavarriaga [4]	TLQ	150	Juan de Olavarriaga, Bilbao	300, **600**	P G	N	0.30	3.00	
Ollargan [2]	CXL	100	Cia de Nav. La Blanca	300, **600**	P G	N	0.30	3.00	
Onton [2]	CXN	100	Cia de Nav. La Blanca	300, **600**	P G	N	0.30	3.00	
Oquendo [2]	CXQ	150	Cia de Nav. La Blanca	300, **600**	P G	N	0.30	3.00	
Oran [4]	TMT	250	Manuel Allende, Bilbao	300, **600**	P G	N	0.30	3.00	
Ordunte Mendi [2]	HMT	200	Cia Naviera Sota y Aznar	300, **600**	P G	N	0.30	3.00	
Orzarosa [2]	TKB	100	Zarauz, Rodrigo y Saracho	300, **600**	P G	N	0.30	3.00	
Osado	EHO	—	Navy	—	O	—	—	—	
Otoyo [2]	CXO	150	Cia de Nav. La Blanca	300, **600**	P G	N	0.30	3.00	
Paulina [2]	HLP	150	Cia Barcelonesc de Nav.	300, **600**	P G	N	0.30	3.00	
Pax [2]	HNT	100	Zarauz, Rodrigo y Saracho	300, **600**	P G	N	0.30	3.00	
Paz de Epalza [2]	TKC	150	Cia Naviera Bidasoa	300, **600**	P G	N	0.30	3.00	
P. Claris [2]	ECL	150	Hijos de J. Taya	300, **600**	P G	N	0.30	3.00	
Pelayo	EBD	270	Navy	—	O	—	—	—	
Peña Angustina [2]	TKD	150	Cia Iberica de Telecomm.	300, **600**	P G	N	0.30	3.00	
Peña Cabarga [2]	TKE	150	Cia Nav. Vizcaya	300, **600**	P G	N	0.30	3.00	
Penalba [4]	HNM	150	Alejandro Navajas, Bilbao	300, **600**	P G	N	0.30	3.00	
Peña Rocias [2]	TKF	150	Cia Sautanderina	300, **600**	P G	N	0.30	3.00	
Pepita Mumbru [4]	TLW	150	Domingo Mumbru, Barcelona	300, **600**	P G	N	0.30	3.00	
Peris Valero [2]	HLO	150	Cia Trasmediteranea	300, **600**	P G	N	0.30	3.00	
Poeta Querol [2]	TKG	150	Cia Trasmediteranea	300, **600**	P G	N	0.30	3.00	
Previsor [2]	TKH	100	La Previsora Naval	300, **600**	P G	N	0.30	3.00	
Princesa de Asturias	EBG	324	Navy	—	O	—	—	—	
Principe de Asturias [4]	TIB	150	Hijos de J. Taya	300, **600**	P G	N	0.30	3.00	
Principe de Piamonte [4]	TMQ	150	Hijos de José Tayá, Barcelona	300, **600**	P G	N	0.30	3.00	
Principe de Viana [4]	TMP	150	Hijos de José Tayá, Barcelona	300, **600**	P G	N	0.30	3.00	
Progreso HLY [4]	HLY	100	Antonio Conde Hijos, Vigo	300, **600**	P G	N	0.30	3.00	
Proserpina	EHR	200	Navy	—	O	—	—	—	

P. Satrústegui [3] ..	EDS	430	Cia Trasatlantica	300, 600	P G ..	N	0.30	3.00
Ramón [2]	CMR	150	Cia Nav. Euzkera	300, 600	P G ..	N	0.30	3.00
Ramón de Bikuña [3] ..	TKI	150	Cia Naviera Bidasoa	300, 600	P G ..	N	0.30	3.00
Ramonita [3]	TKK	150	Cia Near. Espanola	300, 600	P G ..	N	0.30	3.00
Ramón Mumbrú [3] ..	TKJ	200	Domingo Mumbru..	300, 600	P G ..	N	0.30	3.00
Recalde	EBU	220	Navy	—	O ..	—	—	—
Reina Maria Cristina [3]	EDK	430	Cia Trasatlantica	300, 600	P G ..	N	0.30	3.00
Reina Regente ..	EBH	270	Navy	—	O ..	—	—	—
Reina Victoria [3] ..	EFV	300	Cia Trasmedtieranea	300, 600	P G ..	N	0.30	3.00
Reina Victoria Eugenia	EDU	430	Cia Trasatlantica	300, 600	P G ..	N	0.30	3.00
Rey Jaime I [3] ..	EFJ	200	Cia Islena Maritima	300, 600	P G ..	N	0.30	3.00
Rey Jaime II [3] ..	EFS	200	Cia Islena Maritima	300, 600	P G ..	N	0.30	3.00
Rio de la Plata EBK	EBK	—	Navy	—	O ..	—	—	—
Rio Galindo [4]	TLZ	200	Naviera Galindo, Deva	—	—	—	—	—
Rita HLR [3]	HLR	150	Hijorde J. Taya	300, 600	P G ..	N	0.30	3.00
Rita HNA [3]	HNA	150	Hijos de Enrique Gironella ..	300, 600	P G ..	N	0.30	3.00
River Clyde [4]	TMB	200	Antonio Pardo, Santander ..	300, 600	P G ..	X	0.30	3.00
Rogér de Flor [2] ..	HLF	150	Cia Trasmediteranea	300, 600	P G ..	N	0.30	3.00
Romeu [2]	TKL	150	Cia Trasmediteranea	300, 600	P G ..	N	0.30	3.00
Rontegui [2]	TKM	100	Mateo Olaso	300, 600	P G ..	N	0.30	3.00
Rosario ECS [3]	ECS	150	Cia Naviera Guipuzcoana ..	300, 600	P G ..	N	0.30	3.00
Rosendo Masiá [3] ..	TKN	100	Viuda de Llusa y R. Masia ..	300, 600	P G ..	N	0.30	3.00
Sagunto [2]	EEO	180	Cia Trasmediteranea	300, 600	P G ..	N	0.30	3.00
Salazar [2]	TLF	200	Compañia Cantabrica de Navegacion	300, 600	P G ..	N	0.30	3.00
Salvador EFF [3] ..	EFF	100	Cia de Nav. Salvador	300, 600	P G ..	N	0.30	3.00
Salvadora [3]	HLV	150	Uribe y Eguiraun	300, 600	P G ..	N	0.30	3.00
Santi [4]	TMW	100	C. de Zabala, Bilbao	300, 600	P G ..	N	0.30	3.00
Sarita [3]	TNH	200	Compañia Navegacion Bengolea, Bilbao	300, 000	P G ..	N	0.30	3.00
Sebastian [3]	TKQ	200	F. Sanz é Inchaustegui	300, 600	P G ..	N	0.30	3.00
Sendeja [3]	HND	150	Cia Maritima Bilbao	300, 600	P G ..	N	0.30	3.00
Serafín Ballesteros [3] ..	TKR	150	Cia Maritima Ballesteros ..	300, 600	P G ..	N	0.30	3.00
Serra [3]	HLS	150	T. Fierro é Hijos	300, 600	P G ..	N	0.30	3.00
Suarez No. 1 [3].. ..	TND	300	Maritima Suarez S.A., Vigo ..	300, 600	P G ..	N	0.30	3.00
Suarez No. 2 [4].. ..	TMU	100	Maritima Suarez, Vigo.. ..	300, 600	P G ..	N	0.30	3.00
Submarino A. 1 ..	EHX	—	Navy	—	O ..	—	—	—
Submarino A. 2 ..	EHY	—	Navy	—	O ..	—	—	—
Submarino A. 3 ..	EHZ	—	Navy	—	O ..	—	—	—
S. Ana TKP [3]	TKP	150	Hijos de J. Taya	300, 600	P G ..	N	0.30	3.00
S. Cárlos [3]	EDQ	250	Cia Trasatlantica	300, 600	P G ..	N	0.30	3.00
S. Isabel EDJ [3] ..	EDJ	270	Cia Trasatlantica	300, 600	P G ..	N	0.30	3.00
S. José TKO [3]	TKO	150	Hijos de J. Taya	300, 600	P G ..	N	0.30	3.00
S. Mamés [3]	CXX	100	Ruperto de Mendiguren	300, 600	P G ..	N	0.30	3.00
S. Mus [4]	TMD	100	Sociedad A. Egara, Barcelona ..	300, 600	P G ..	N	0.30	3.00
S. Salvador [3]	TLO	200	Mendiguren y Zaballa	300, 600	P G ..	N	0.30	3.00
Tablada [3]	TKS	150	Naviera Sevillana	300, 600	P G ..	N	0.30	3.00
Tambre [2]	EEZ	150	Cia Trasmediteranea	300, 600	P G ..	N	0.30	3.00
Tamesis [3]	TLM	150	Garrigos é Hijos	300, 600	P G ..	N	0.30	3.00
Tangoreño [3]	EFM	150	Uriarte y Cia	300, 600	P G ..	N	0.30	3.00
Tarrasa [4]	TLB	100	Soc. Anon. Astilleros Mediterraneo	300, 600	P G ..	N	0.30	3.00
Teodoro Llorente [3] ..	EET	150	Cia Trasmediteranea	300, 600	P G ..	N	0.30	3.00
Teresa TKT [3]	TKT	100	Ricardo Ortiz Artinano	300, 600	P G ..	N	0.30	3.00
Teresa Fábregas [3] ..	CXT	150	Cia de Nav. Fabregas y Garcia ..	300, 600	P G ..	N	0.30	3.00

Ship Stations—*Continued*

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SPAIN—*contd.*							Francs.	Francs.	
Teresa Pamies [3]	EFE	150	Cia de Nav. Fabregas y Garcia	300, **600**	P G	N	0.30	3.00	
Teresa Tayá [3]	ECR	150	Hijos de J. Taya	300, **600**	P G	N	0.30	3.00	
Terrór EHS	EHS	—	Navy	—	O	—	—	—	
Tiflis [6]	TMA	150	Compañia Vasco-Valenciana de Navegacion	300, **600**	P G	N	0.30	3.00	
Tintoré [3]	HNP	150	Cia Trasmediterania	300, **600**	P G	N	0.30	3.00	
Tirso EFX [3]	EFX	150	Cia Trasmediterania	300, **600**	P G	N	0.30	3.00	
Tirso HNH	HNH	150	Hijos de Enrique Girouella	300, **600**	P G	N	0.30	3.00	
Tordera [1]	HLK	150	Cia Trasmediterania	300, **600**	P G	N	0.30	3.00	
Torpedero No. 1	EHA	—	Navy	—	O	—	—	—	
Torpedero No. 2	EHB	—	Navy	—	O	—	—	—	
Torpedero No. 3	EHC	—	Navy	—	O	—	—	—	
Torpedero No. 4	EHD	—	Navy	—	O	—	—	—	
Torpedero No. 5	EHE	—	Navy	—	O	—	—	—	
Torpedero No. 6	EHF	—	Navy	—	O	—	—	—	
Torpedero No. 7	EHG	—	Navy	—	O	—	—	—	
Torpedero No. 8	EHH	—	Navy	—	O	—	—	—	
Torpedero No. 9	EHI	—	Navy	—	O	—	—	—	
Torpedero No. 10	EHJ	—	Navy	—	O	—	—	—	
Torpedero No. 11	EHK	—	Navy	—	O	—	—	—	
Torpedero No. 12	EHL	—	Navy	—	O	—	—	—	
Torpedero No. 13	EHM	—	Navy	—	O	—	—	—	
Torpedero No. 14	EHN	—	Navy	—	O	—	—	—	
Torpedero No. 15	CLA	—	Navy	—	O	—	—	—	
Torpedero No. 16	CLB	—	Navy	—	O	—	—	—	
Torpedero No. 17	CLC	—	Navy	—	O	—	—	—	
Torpedero No. 18	CLG	—	Navy	—	O	—	—	—	
Torpedero No. 19	CLH	—	Navy	—	O	—	—	—	
Torpedero No. 20	CLI	—	Navy	—	O	—	—	—	
Torpedero No. 21	CLJ	—	Navy	—	O	—	—	—	
Torpedero No. 22	CLK	—	Navy	—	O	—	—	—	
Torpedero No. 23	CLL	—	Navy	—	O	—	—	—	
Torpedero No. 24	CLM	—	Navy	—	O	—	—	—	
Torras y Bages [3]	EEE	150	Cia Trasmediterania	300, **600**	P G	N	0.30	3.00	
Torreblanca [3]	EFP	150	Cia Trasmediterania	300, **600**	P G	N	0.30	3.00	
Torre del Oro [3]	TKU	150	Hijos de J. Taya	300, **600**	P G	N	0.30	3.00	
Torrontero [3]	TNB	150	Compañia Naviera Bermeo	300, **600**	P G	N	0.30	3.00	
Tres Hermanos [3]	TLG	150	J. Martinez Fernandez	300, **600**	P G	N	0.30	3.00	
Trini [3]	HNL	150	Hijos de Enrique Gironella	300, **600**	P G	N	0.30	3.00	

[illegible] ..	EFU	250	Cia Trasmediterania ..	300, 600	P G	N	0.30	3.00
[illegible][2] ..	HMV	250	Sota y Aznar ..	300, 600	P G	N	0.30	3.00
[illegible] ..	HMW	200	Sota y Aznar ..	300, 600	P G	N	0.30	3.00
[illegible]-Mendi[2] ..	HMX	200	Sota y Aznar ..	300, 600	P G	N	0.30	3.00
[illegible]-Mendi[2] ..	HMY	200	Sota y Aznar ..	300, 600	P G	N	0.30	3.00
Valencia CMX ..	CMX	100	Cia Espanola de Nav. ..	300, 600	P G	N	0.30	3.00
Valentin[2] ..	TKV	100	Wenceslao Gonzalez Garra	300, 600	P G	N	0.30	3.00
Valmurian[2] ..	TKW	150	Cia Naviera Valmurian ..	300, 600	P G	N	0.30	3.00
Velarde[2] ..	HME	100	Alejandro Litani ..	300, 600	P G	N	0.30	3.00
Vicente Ferrer[2] ..	EEF	100	Cia Trasmediterania ..	300, 600	P G	N	0.30	3.00
Vicente La Roda[2] ..	EER	180	Cia Trasmediterania ..	300, 600	P G	N	0.30	3.00
Vicente Puchol[4] ..	EEP	180	Cia Trasmediterania ..	300, 600	P G	N	0.30	3.00
Victor Chávarri[2] ..	CMG	150	Altos Hornos de Vizcaya ..	300, 600	P G	N	0.30	3.00
Villaamicl ..	EBP	140	Navy ..	—	O	—	—	—
Villafrana[2] ..	TKZ	150	S. A. Naviera Espanola ..	300, 600	P G	N	0.30	3.00
Villagarci[2] ..	EFW	150	Hijos de Francisco deza ..	300, 600	P G	N	0.30	3.00
Villamanrique[2] ..	HNF	150	Gutierrez Hermanos ..	300, 600	P G	N	0.30	3.00
Villaodrid[2] ..	CXV	100	Jose Zarauz Villaodrid ..	300, 600	P G	N	0.30	3.00
Villareal EEW[2] ..	EEW	180	Cia Trasmediterania ..	300, 600	P G	N	0.30	3.00
Villasandino[2] ..	HNG	150	Cia Naviera Gascuna ..	300, 600	P G	N	0.30	3.00
Viuda de Llusá[2] ..	TKX	100	Viuda de Llusa y R. Masia	300, 600	P G	N	0.30	3.00
Viva[2]	TKY	150	Manuel Lopez Marin ..	300, 600	P G	N	0.30	3.00
Wenceslao[2] ..	HNK	150	Wenceslao Jonzalez Jarra	300, 600	P G	N	0.30	3.00
Yandiola[2] ..	CXY	150	Cia Naviera Guipuz Coana	300, 600	P G	N	0.30	3.00
Yute[2]	EDE	150	Cia Naviera Guipuz Coana	300, 600	P G	N	0.30	3.00
SWEDEN								
Abisko[1]	SFL	150	**Trafikaktiebolaget Grangesberg-Oxelösund**	300, 450, 600	P	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00
Adolf[2]	SKH	250	**Angfartygsaktiebolaget Adolf** ..	300, 600	P	X	0.40	4.00
Africanic[1] ..	SFS	250	**Rederiaktiebolaget Transatlantic (Gottenburg S. Africa Line)**	300, 600	P	—[4]	0.40	4.00
Aldebaran SLF[2] ..	SLF	250	**Erik Brodins Rederi Aktiebolog, Torö**	300, 600	P	0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000	0.40	4.00
Alstern[2]	SJA	250	**Rederiaktiebolaget Transatlantic**	300, 600	P	—[4]	0.40	4.00
Anglia SIA[2] ..	SIA	250	**Rederiaktiebolaget Svenska Lloyd**	300, 600	P	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
Anna SMI[2] ..	SMI	150	**Rederiaktiebolaget Skåne, Malmö**	300, 600	P	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
Annie Johnson[2] ..	SHH	350	**Rederiaktiebolaget Nordstjernan**	300, 600	P	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Antares SLH[2] ..	SLH	250	**Erik Brodins Rederi Aktiebolag, Torö**	300, 600	P	—[5]	0.40	4.00

[1] Operated by the owners: controlled by the Soc. Anonyme Internationale de Tel. sans Fil

[2] Operated and controlled by the owners

[3] Operated and controlled by the Soc. Anonyme Internationale de Tel. sans Fil

[4] 0300 to 0400, 0700 to 0800, 1100 to 1200, 1500 to 1600, 1900 to 2000, 2300 to 2400. (Local Mean Time)

[5] During a voyage not exceeding 7 hours: continuous service. For longer voyages: 0300 to 0410, 0700 to 0810, 1100 to 1210, 1500 to 1610, 1900 to 2010, 2300 to 0010 and during first ten minutes of each other hour

[6] 0800 to 0830, 1200 to 1230, 2000 to 2030. (Local Mean Time)

[7] 2400 to 0030, 0800 to

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.
SWEDEN—*contd.*							Francs.	Francs.
Anten [8]	SHI	250	Rederiaktiebolaget Transatlantic	300, **600**	P ..	—[6]	0.40	4.00
Aran	SBH	—	Navy	—	O ..	—	—	—
Aries [8]	SJQ	250	Erik Brodins Rederi Aktiebolag	300, **600**	P ..	0600 to 0700 1000 to 1100 1400 to 1500 1800 to 1900	0.40	4.00
Aspen [1]	SHG	250	Rederiaktiebolaget Transatlantic	300, **600**	P ..	—[4]	0.40	4.00
Astur [8]	SLV	250	Rederiaktiebolaget S.S.A., Stockholm	300, **600**	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
Atland [4]	SHY	350	Angfartygsaktiebolaget Tirfing ..	300, **600**	P ..	—[6]	0.40	4.00
Atlantic [1]	SFT	250	Rederiaktiebolaget Transatlantic	300, **600**	P ..	—[4]	0.40	4.00
Augusta [8]	SLY	250	Rederiaktiebolaget Banco, Stockholm	300, **600**	P ..	—[6]	0.40	4.00
August Leffler [8] ..	SLZ	250	I. Lilljequist & Son, Gothenburg..	300, **600**	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
Australic [1]	SFH	250	Rederiaktiebolaget Transatlantic	300, **600**	P ..	—[4]	0.40	4.00
Axel Johnson [8] ..	SGK	350	Rederiaktiebolaget Nordstjernan	300, **600**	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Balboa SHX [8]	SHX	350	Rederiaktiebolaget Nordstjernan	300, **600**	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
Balder [8]	SGO	200	Rederiakt-Svenska Lloyd	300, **600**	P G ..	N	0.40	2.80
Baltic SFU [1]	SFU	250	Rederiaktiebolaget Transatlantic	300, **600**	P ..	—[4]	0.40	4.00
Bele [8]	SGP	200	Rederiaktiebolag Svenska Lloyd	300, **600**	P G ..	N	0.40	2.80
Belos SFI [8]	SFI	250	Life-ship belonging to the Bergnings-och Dykeri-Aktiebolaget-Neptun	300, **600**	P ..	—[4]	0.40	4.00

Remarks.

0830, 1200 to 1230, 1600 to 1630, 2000 to 2030. (Local Mean Time)

[8] The station is open the last 20 minutes of each hour, from 0740 to 1800. (Local Mean Time)

[9] 0700 to 0800, 1100 to 1200, 1500 to 1600, 1900 to 2000

[10] 0600 to 0700, 1100 to 1200, 1500 to 1600, 1800 to 1900

[11] 0800 to 0815, 1200 to 1215, 1600 to 1615, 2000 to 2015

[12] The accounts are settled by the Direction Générale des Télégraphes de Suède, Stockholm

Benares [3]	SKI	250	Aktiebolaget Svenska Ostasiatiska Kompaniet, Gothenburg ..	300, 600	P	..	—[6]	0.40	4.00
Bernicia [3]	SIW	250	Rederiaktiebolaget Transatlantic	300, 600	P	..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
B. G. Kronberg [3] ..	SLK	250	Erik Brodins Rederi Aktiebolag, Toro	300, 600	P	..	—[9]	0.40	4.00
Bia [3]	SFR	250	Rederiaktiebolaget Bore, Gothenburg	300, 600	P	..	—[7]	0.40	4.00
Blenda	SBX	—	Navy	—	O	..	—	—	—
Boden [1]	SFW	150	Trafikaktiebolaget Grangesberg-Oxelösund	300, 600	P	..	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00
Bolivia [1]	SMT	150	Rederiaktiebolaget Svenska Lloyd	300, 600	P	..	—[10]	0.40	4.00
Bolmen [1]	SHA	250	Rederiaktiebolaget Transatlantic	300, 600	P	..	—[4]	0.40	4.00
Boren [13]	SDT	250	Rederiaktiebolaget Transatlantic	300, 600	P	..	—[4]	0.40	4.00
Borg [3]	SKY	150	Rederiaktiebolaget Borg	300, 600	P	..	—[6]	0.40	4.00
Braheholm [2]	SKK	250	Aktiebolaget Svenska Amerika Mexiko Linien, Gothenburg	300, 600	P	..	—[6]	0.40	4.00
Bråvalla [3]	SJP	250	Rederiaktiebolaget Trelleborg ..	300, 600	P	..	—[6]	0.40	4.00
Bris [3]	SHT	250	Rederiaktiebolaget Bore	300, 600	P	..	—[7]	0.40	4.00
Buenos Aires SIU [3] ..	SIU	350	Raderiaktiebolaget Nordstjernan	300, 600	P	..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
Bullaren [3]	SHN	250	Rederiaktiebolaget Transatlantic	300, 600	P	..	—[4]	0.40	4.00
Calabria SMV	SMV	150	Rederiaktiebolaget Svenska Lloyd	300, 600	P	..	—[10]	0.40	4.00
Canada SDQ [2]	SDQ	250	Rederiaktiebolaget Nordstjernan (Sweden—South America Line)	300, 600	P	..	0600 to 0800 1000 to 1200 1400 to 1600 1800 to 1900	0.40	4.00
Carlsholm [1]	SGR	350	Svenska America-Mexico Linjen	300, 600	P G	..	—[6]	0.40	4.00
Carmen SIP [3]	SIP	200	Rederiaktiebolaget Carmen ..	300, 600	P	..	X	0.40	4.00
Carolina SJG [3]	SJG	150	Afrikanska Angfartygs Aktiebolaget	300, 600	P	..	0830 to 0930 1230 to 1330 1930 to 2030 2330 to 0030	0.40	4.00
Catalonia [3]	SID	250	Rederiaktiebolaget Svenska Lloyd	300, 600	P	..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
Cavalla [3]	SIK	250	Rederiaktiebolaget Sverige-Levanten	300, 600	P	..	—[6]	0.40	4.00
Ceylon SGY [1]	SGY	350	Swedish East Asiatic Co. ..	300, 600	P	..	—[6]	0.40	4.00
C. F. Liljevalch [3] ..	SLU	250	Trafikaktiebolaget Grängesberg-Oxelösund, Stockholm	300, 600	P	..	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00
Claes Horn	SBQ	—	Navy	—	O	..	—	—	—
Clas Flemming	SCI	—	Navy	—	O	..	—	—	—
Convallaria [3]	SDD	250	Rederiaktiebolaget Activ, Halsingborg	300, 600	P	..	—[9]	0.40	4.00
Dristighetten ..	SBG	—	Navy	—	O	..	—	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
SWEDEN—*contd.*									
Drott	SBW	—	Navy	—	O ..	—	—	—	
Drottningholm [3] ..	SJM	250	Rederiaktiebolaget Sverige-Nordamerika	300, **600**	P G ..	N	0.40	4.00	
Drottning Sophia [3] ..	SHK	350	Rederiaktiebolaget Nordstjernan	300, **600**	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80	
Drottning Victoria ..	SCP	—	Navy	—	O ..	—	—	—	
Drottning Viktoria [3] ..	SEB	100	State Railways (Sassnitz-Trälleborg Line)	300, **875**, 600	P R, O	X	—	—	
Edda	SBV	—	Navy	—	O ..	—	—	—	
Egil [3]	SIN	100	Stockholms Rederiaktiebolag Svea	300, **600**	P G ..	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000	0.28	2.80	
Elmaren [3]	SKC	250	Rederiaktiebolaget Transatlantic	300, **600**	P ..	—[4]	0.40	4.00	
Elsa [3]	SJD	150	Svenska Lantmanens Rederiaktiebolag	300, **600**	P ..	X	0.40	4.00	
Eros SDN	SDN	250	Rederiet Belos	300, **600**	P ..	—[6]	0.40	4.00	
Ester [1]	SLW	250	Rederiaktiebolaget Ester.. ..	300, **600**	P ..	—[6]	0.40	4.00	
Fagervik [3]	SLM	250	Norrköpings Rederiaktiebolag, Norrköping	300, **600**	P ..	—[6]	0.40	4.00	
Falka [3]	SGZ	250	Rederiaktiebolaget H. Modin, Stockholm	300, **600**	P ..	—[6]	0.40	4.00	
Faxen [3]	SHU	250	Rederiaktiebolaget Transatlantic	300, **600**	P ..	0600 to 0700 1300 to 1400 1800 to 1900	0.28	2.80	
Finn SDG [3]	SDG	150	Stockholms Rederiaktiebolag Svea	300, **600**	P ..	—[4]	0.40	4.00	
Formosa SDM [3] ..	SDM	250	Aktiebolaget Svenska Ostasiatiska Kompaniet (Sweden-East Asia Line)	300, **600**	P ..	—[6]	0.40	4.00	
Fritiof [1]	SDB	250	Life-ship belonging to the Goteborgs Bogserings Aktiebolag	300, **600**	P ..	X	0.40	4.00	
Fylgia	SBM	—	Navy	—	O	—	—	—	
Gallia [3]	SJV	250	Rederiaktiebolaget Svenska Lloyd, Gothenburg	300, **600**	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	

Name	Call		Owner			Hours		
G. D. Kennedy[1]	SGV	100	Rederiaktiebolaget Transatlantic	300, 600	P	—[6]	0.40	4.00
Gefle[1]	SML	150	Angfartygs Aktiebolaget Gefle, Torö	300, 600	P	—[6]	0.40	4.00
Gellivare[8]	SLP	250	Trafikaktiebolaget Grangesberg-Oxelosund, Stockholm	300, 600	P	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00
Gerd[8]	SLB	250	Stockholms Rederiaktiebolag Svea, Stockholm	300, 600	P	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400	0.40	4.00
Gertrud[8]	SME	100	Angfartygs Aktiebolaget Nordsjon, Gothenburg	300, 600	P	X	0.40	4.00
Glan[8]	SKZ	150	Rederiaktiebolaget Motala Ström, Norrkoping	300, 600	P	—[6]	0.40	4.00
Gloria SJB[8]	SJB	200	Rederiaktiebolaget Gloria	300, 600	P	X	0.40	4.00
Gota	SBB	—	Navy	—	O	—	—	—
Gotaland[8]	SKO	250	Ampfartygsocktiebolaget Tirfing, Gothenburg	300, 600	P	—[6]	0.40	4.00
Gottfrid[8]	SKD	150	Rederiaktiebolaget Gottfrid, Langsele	300, 600	P	0800 to 0830 1230 to 1300 (local mean time) 1900 to 1930	0.40	4.00
Graecia[1]	SJU	250	Rederiaktiebolaget Svenska Lloyd	300, 600	P	—[10]	0.40	4.00
Grangesberg[2]	SLT	250	Trafikaktiebolaget Grangesberg, Oxelosund	300, 600	P	—[11]	0.40	4.00
Gudmundra[12]	SDL	250	Rederiaktiebolaget Fredrika	300, 600	P	—[8]	0.40	4.00
Gullmarn[8]	SIG	150	Rederiaktiebolaget Transatlantic	300, 600	P	—[4]	0.40	4.00
Gunborg[8]	SJF	250	Angfartygs Aktiebolaget Thorsten	300, 600	P	0800 to 0900 1200 to 1300 1600 to 1700 2000 to 2100	0.40	4.00
Gustaf V	SCO	—	Navy	—	O	—	—	—
Gustavsholm[8]	SIH	250	Aktie. Svenska Amerika-Mex. Linien	300, 600	P	—[6]	0.40	4.00
Hansa[8]	SHO	150	Angfartysaktiebolaget Gotland	300, 600	P G	N	0.28	2.80
Harald SIE[8]	SIE	100	Goteborgs Bogserings Aktie.	300, 600	P	X	0.28	2.80
Heimdall[2]	SGH	160	Stockholms Rederiaktiebolag Svea.	300, 600	P G	0300 to 0400 0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400	0.28	2.80
Hellenic[1]	SFF	250	Rederiaktiebolaget Transatlantic	300, 600	P	—[4]	0.40	4.00
Hemland[1]	SKV	150	Angfartygs Aktiebolaget Tirfing	300, 600	P	—[6]	0.40	4.00
Hermes SIM[8]	SIM	100	Bergnings- och Dykeri-Aktie. Neptun.	300, 600	P	0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000 2300 to 2400	0.40	4.00

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
SWEDEN—*contd.*							Francs.	Francs.	
Hibernia SFA [3] ..	SFA	250	Rederiaktiebolaget Svenska Lloyd	300, **600**	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	
Hjalmar Blomberg [3] ..	SMF	250	Stockholms Rederiaktiebolag Svea, Stockholm	300, **600**	P ..	—[4]	—	—	
Hogland [13]	SKL	250	Angfartygsaktiebolaget Tirfing ..	300, **600**	P ..	—[6]	0.40	4.00	
Holmengra [2]	SGN	250	Aktiebolaget Nordiska-Lloyd ..	300, **600**	P ..	—[9]	0.40	4.00	
Holmia [3]	SIQ	250	Rederiaktiebolaget Svenska Lloyd	300, **600**	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	
Hugin	SCE	—	Navy	—	O ..	—	—	—	
H. Uner [3]	SJH	250	H. Uner, Aktiebolag	300, **600**	P ..	—[6]	0.40	4.00	
Immeln [3]	SJX	250	Rederiaktiebolaget Transatlantic, Gothenburg	300, **600**	P ..	[4]	0.40	4.00	
Indianic [1]	SFE	250	Rederiaktiebolaget Transatlantic	300, **600**	P ..	—[4]	0.40	4.00	
Indus [3]	SMH	250	Aktiebolaget Svenska-Ostasiatiska Kompaniet, Gothenburg	300, **600**	P ..	—[6]	0.40	4.00	
Inland [13]	SKQ	250	Angfartygsaktiebolaget Tirfing ..	300, **600**	P ..	—[6]	0.40	4.00	
Irene SDC [1]	SDC	150	Rederiaktiebolaget Karnan ..	300, **600**	P ..	—[9]	0.40	4.00	
Isbrytaren II [3] ..	SHR	150	Ice boat belonging to the City of Stockholm	300, **600**	P ..	—[8]	—	—	
Italia SIV	SIV	250	Rederiaktiebolaget Svenska Lloyd	300, **600**	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	
Jacob Bagge	SBP	—	Navy	—	O ..	—[c]	—	—	
Jaffa [3]	SGQ	250	Rederiaktiebolaget Sverige-Levanten	300, **600**	P ..	—[6]	0.40	4.00	
Japan SGX [1]	SGX	350	Swedish East Asiatic Co. ..	300, **600**	P ..	—[6]	0.40	4.00	
Kalix [1]	SLQ	250	Trafikaktiebolaget Grangesberg-Oxelosund	300, **600**	P ..	—[11]	0.40	4.00	
Karlsvik [3]	SLN	250	Norrkopings Rederiaktiebolag ..	300, **600**	P ..	—[6]	0.40	4.00	
Kiruna [13]	SDK	250	Trafikaktiebolaget Grangesberg-Oxelosund	300, **600**	P ..	—[11]	0.40	4.00	
Knappingsborg [3] ..	SGA	250	Rederiaktiebolaget Borg, Norrköping	300, **600**	P ..	—[6]	0.40	4.00	

Konung Gustaf V.[2] ..	SEA	100	State Railways (Sassnitz-Trelleborg Line)	300, 375, 600	P R, O..	X	—	—
Kratos[1]	SFQ	250	Rederiaktiebolaget Transatlantic	300, 600	P ..	—[4]	0.40	4.00
Kronprinsessan Margareta[2]	SFY	350	Rederiaktiebolaget Nordstjernan	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Kronprinsessan Victoria[2]	SGB	350	Rederiaktiebolaget Nordstjernan	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Kronprins Gustaf[2] ..	SHL	350	Rederiaktiebolaget Nordstjernan	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Kronprins Gustaf Adolf[2]	SFV	350	Rederiaktiebolaget Nordstjernan	300, 600	P ..	0600 to 0700 1100 to 1100 1400 to 1500 1800 to 1900	0.28	2.80
Lestris	SKF	250	Rederiaktiebolaget S.S.A., Stockholm	300, 600	P ..	—[10]	0.40	4.00
Liguria SIB[2]	SIB	250	Rederiaktiebolaget Svenska Lloyd	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
Lima SHJ[2]	SHJ	350	Rederiaktiebolaget Nordstjernan	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Lisa Brodin[2]	SGI	250	Erik Brodins Rederi Aktiebolag, Torö	300, 600	P ..	—[9]	0.40	4.00
Lombardia SIX[2] ..	SIX	250	Rederiaktiebolaget Svenska Lloyd	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
Lord[2]	SMD	150	Rederiaktiebolaget Vala, Halsingborg	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
Lygnern[2]	SMC	250	Rederiaktiebolaget Transatlantic, Gothenburg	300, 600	P ..	—[4]	0.40	4.00
Magda[2]	SHS	250	Afrikanska Angfartygs Aktie. ..	300, 600	P ..	—[7]	0.40	4.00
Magne	SBZ	—	Navy	—	O ..	—	—	—
Malmen[2]	SJZ	250	Rederiaktiebolaget Transatlantic	300, 600	P ..	[4]	0.40	4.00
Malmo[3]	SED	100	State Railways (Malmö-Copenhagen Line)	300, 375, 600	O ..	X	—	—
Manligheten	—	—	Navy	—	O ..	—	—	—
Marie[2]	SDI	150	Angfartygs Aktiebolaget Pallas..	300, 600	P ..	—[10]	0.40	4.00
Marta[2]	SMB	150	Rederiaktiebolaget Carl, Halsingborg	300, 600	P ..	0700 to 0800 1100 to 1200 1500 to 1600 1900 to 2000	0.40	4.00

Ship Stations—*Continued*

Name	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
SWEDEN—*contd.*									
Masiliö [2]	SIC	250	Rederiaktiebolaget Svenska Lloyd	300, **600**	P	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00	
Mertainen [8]	SIT	250	Trafikaktiebolaget Grangesberg-Oxelösund	300, **600**	P	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00	
Meta [2]	SFM	150	Angfartygs Aktiebolaget Ostersjen	300, **600**	P	X	0.40	4.00	
Miranda [2]	SJL	250	Rederiaktiebolaget Mimosa	300, **600**	P	—[9]	0.40	4.00	
Mjörn	SJC	100	Rederiaktiebolaget Transatlantic	300, **600**	P	—[8]	0.28	2.80	
Mode	SBY	—	Navy	—	O	—	—	—	
Moria [1]	SMP	150	Rederiaktiebolaget Svenska Lloyd	300, **600**	P	—[10]	0.40	4.00	
Munin	SCF	—	Navy	—	O	—	—	—	
Narvik [1]	SFX	150	Trafikaktiebolaget Grangesberg-Oxelösund	300, **600**	P	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00	
Nils Uner [8]	SLO	250	H. Uner, Aktiebolag	300, **600**	P	—[6]	0.40	4.00	
Niord	SBF	—	Navy	—	O	—	—	—	
Nippon SIO [2]	SIO	350	Swedish East Asiatic Co.	300, **600**	P	—[6]	0.40	4.00	
Nordic [1]	SGG	250	Rederiaktiebolaget Transatlantic	300, **600**	P	—[4]	0.40	4.00	
Nordland [3]	SKN	250	Angfartygsaktiebolaget Tirfing	300, **600**	P	—[6]	0.40	4.00	
Norrköping [8]	SJR	250	Rederiaktiebolaget Motala Ström, Norrköping	300, **600**	P	—[6]	0.40	4.00	
Nyland	SKP	250	Angfartygsaktiebolaget Tirfing	300, **600**	P	—[6]	0.40	4.00	
O. A. Brodin [8]	SLD	250	Erik Brodins Rederi Aktiebolag, Torö	300, **600**	P	—[9]	0.40	4.00	
Odessa SII [8]	SII	250	Rederiaktiebolaget Sverige-Levanten	300, **600**	P	—[6]	0.40	4.00	
Olof Brodin [8]	SLJ	250	Erik Brodins Rederi Aktiebolag, Torö	300, **600**	P	—[9]	0.40	4.00	
Orania [1]	SDF	250	Fornyade Angfartygs Aktiebolaget Gotha	300, **600**	P	X	0.40	4.00	
Ornen	SBO	—	Navy	—	O	—	—	—	
Orvar [8]	SMJ	150	Rederiaktiebolaget Orvar	300, **600**	P	—[10]	0.40	4.00	
Oscar II SBL	SBL	—	Navy		O				

Oscar Fredrik [9] .	SHM	350	Rederiaktiebolaget Nordstjernan	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Oscar Midling [13] ..	SHV	250	Rederiaktiebolaget Fredrika ..	300, 600	P ..	—[9]	0.40	4.00
Pacific SFZ [9]	SFZ	350	Rederiaktiebolaget Nordstjernan	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Patricia SHW [7] ..	SHW	200	Rederiaktiebolaget Svenska Lloyd	300, 600	P G ..	N	0.40	4.00
Pedro Christophersen [9]	SGF	350	Rederiaktiebolaget Nordstjernan	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Polcirkelm [9] . ..	SLR	250	Trafikaktiebolaget Grangesberg-Oxelösund	300, 600	P ..	—[11]	0.40	4.00
Porjus [9]	SJT	250	Trafikaktiebolaget Grangesberg, Oxelösund	300, 600	P ..	—[11]	0.40	4.0
Portos [1]	SHC	250	Rederiaktiebolaget H. Modin, Stockholm	300, 600	P ..	—[9]	0.40	4.00
Prinsessan Ingeborg [9]	SHB	350	Rederiaktiebolaget Nordstjernan	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Psilander . ..	SBS	—	Navy	—	O ..	—	—	—
Ragnar	SCB	—	Navy	—	O ..	—	—	—
Ragne [9] . ..	SIY	200	Stockholms Rederiaktiebolag Svea.	300, 600	P Ġ ..	—[5]	0.40	4.00
Ragunda [9] . ..	SDA	150	Rederiaktiebolaget Fredrika ..	300, 600	P ..	—[9]	0.40	4.00
Reserv [9]	SKG	150	Sunds Rederi Aktiebolag ..	300, 600	P ..	—[9]	0.40	4.00
Rota SBT . ..	SBT	—	Navy	—	O ..	—	—	—
Saga SFB [9] . .	SFB	150	Angf. Aktieb. Thule	300, 600	P G ..	N	0.28	2.80
Sagoland [1]	SGM	350	Angfartygsaktiebolaget Tirfing. ..	300, 600	P ..	—[4]	0.40	4.00
Salen [9]	SIR	250	Rederiaktiebolaget Transatlantic	300, 600	P ..	—[4]	0.40	4.00
Salonica SKX [13] ..	SKX	150	Rederiaktiebolaget Sverige-Levanten	300, 600	P ..	—[6]	0.40	4.00
San Francisco SGC [9] ..	SGC	350	Rederiaktiebolaget Nordstjernan	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Scotia SFD [1]	SFD	250	Rederiaktiebolaget Svenska Lloyd	300, 600	P ..	—[10]	0.40	4.00
Signe [9]	SJK	250	Rederiaktiebolaget Tyr	300, 600	P ..	—[9]	0.40	4.00
Sigurd	SCC	—	Navy	—	O ..	—	—	—
Sigvar [13]	SDR	150	Rederiaktiebolaget Ingvar ..	300, 600	P ..	—[9]	0.40	4.00
Sigyn [9]	SJE	250	Stockholms Rederiaktiebolag Svea	300, 600	P ..	X	0.40	4.00
Siljan [1]	SGJ	250	Rederiaktiebolaget Transatlantic	300, 600	P ..	—[4]	0.40	4.00
Sir Ernest Cassel [1] ..	SFP	150	Trafikaktiebolaget Grängesberg-Oxelösund	300, 600	P ..	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00
Skagerak [9] ..	SEC	70	Government	300, 600	P ..	0630 to 0730 0930 to 1130 1430 to 1530 1630 to 1730	—	—
Skagern [1] ..	SGU	250	Rederiaktiebolaget Transatlantic	300, 600	P ..	—[4]	0.40	4.00

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
SWEDEN—*contd.*							Francs.	Francs.	
Skäggald	SCJ	—	Navy	—	O	—	—	—	
Skuld	SBU	—	Navy	—	O	—	—	—	
Smaland [1]	SKU	150	Angfartygs Aktiebolaget Tirfing	300, **600**	P	—[6]	0.40	4.00	
Smyrna [3]	SKR	250	Rederiaktiebolaget Sverige-Levanten, Gothenburg	300, **600**	P	—[6]	0.40	4.00	
Sonja [3]	SIZ	250	Rederiaktiebolaget Transatlantic	300, **600**	P	—[6]	0.40	4.00	
Stockholm [3]	SGL	250	Rederiaktiebolaget Sverige Nord-Amerika	300, **600**	P G	N	0.40	4.00	
Storvik	SLL	250	Norrköpings Rederiaktiebolag, Norrköping	300, **600**	P	—[6]	0.40	4.00	
Stureholm [3]	SIL	350	Aktie. Svenska Amerika Mexiko Linien	300, **600**	P	—[6]	0.40	4.00	
Suecia [3]	SGT	350	Rederiaktiebolaget Nordstjernan	300, **600**	P G	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80	
Sumatra SGD [1]	SGD	350	Swedish East Asiatic Co.	300, **600**	P G	—[6]	0.40	4.00	
Svarten [3]	SIS	250	Rederiaktiebolaget Transatlantic	300, **600**	P	—[4]	0.40	4.00	
Svarton [1]	SLS	250	Trafikaktiebolaget Grangesberg - Oxelösund	300, **600**	P	—[11]	0.40	4.00	
Svea	SBA	—	Navy	—	O	—	—	—	
Svenskund	SCK	—	Navy	—	O	—	—	—	
Sverige	SCL	—	Navy	—	O	—	—	—	
Sydic [1]	SGF	250	Rederiaktiebolaget Transatlantic	300, **600**	P	—[4]	0.40	4.00	
Tapperheten	SBJ	—	Navy	—	O	—	—	—	
Tasmanic [1]	SFG	250	Rederiaktiebolaget Transatlantic	300, **600**	P	—[4]	0.40	4.00	
Texas SFD [1]	SFD	200	Svenska Amerika-Mexico Linjen	300, **600**	P	2400 to 0015 0400 to 0415 0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00	
Textil [3]	SJN	250	Rederiaktiebolaget Helios	300, **600**	P	—[6]	0.40	4.00	
Therese [1]	SLX	250	Rederiaktiebolaget Ester	300, **600**	P	—[6]	0.40	4.00	
Thor	SBE	—	Navy	—	O	—	—	—	
Thordön	SCH	—	Navy	—	O	—	—	—	
Thule SBC	SBC	—	Navy	—	O	—	—	—	
Thule SFC [3]	SFC	150	Angf. Aktieb. Thule	300, **600**	P G	N	0.28	2.80	

Thyra SLA [6]	SLA	150	Rederiaktiebolaget Johannisborg, Norrköping	300, 600	P ..	—	0.40	4.00
Tilia [1]	SMQ	150	Rederiaktiebolaget Svenska Lloyd	300, 600	P ..	—[10]	0.40	4.00
Tirfing	SCG	—	Navy	—	O ..	—	—	—
Tisnaren [2]	SHQ	250	Rederiaktiebolaget Transatlantic	300, 600	P ..	—[4]	0.40	4.00
Torne [1]	SFJ	150	Trafikaktiebolaget Grandesberg-Oxelösund	300, 450, 600	P ..	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00
Turbinia SHZ [5] ..	SHZ	250	Rederiaktiebolaget Svenska Lloyd	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.40	4.00
Ulla [5]	SDJ	250	Aktiebolaget Transmarin ..	300, 600	P ..	—[5]	0.40	4.00
Unden [5]	SMG	250	Rederiaktiebolaget Transatlantic, Gothenburg	300, 600	P ..	—[4]	0.40	4.00
Uppland [5]	SKT	250	Angfartygsaktiebolaget Tirfing, Gothenburg	300, 600	P ..	—[6]	0.40	4.00
Valparaiso [5]	SGW	350	Rederiaktiebolaget Nordstjernan	300, 600	P ..	0600 to 0700 1100 to 1200 1400 to 1500 1800 to 1900	0.28	2.80
Varna	SIJ	250	Rederiaktiebolaget Sverige-Levanten	300, 600	P ..	—[6]	c.40	4.00
Vidar	SCD	—	Navy	—	O ..	—	—	—
Viken [2]	SJJ	250	Rederiaktiebolaget Transatlantic	300, 600	P ..	—[4]	0.40	4.00
Vinga [2]	SIF	150	Rederiaktiebolaget Transatlantic	300, 600	P ..	—[4]	0.40	4.00
Vollrath Tham [1] ..	SFO	150	Trafikaktiebolaget Grangesberg-Oxelösund	300, 600	P ..	0800 to 0815 1200 to 1215 1600 to 1615 2000 to 2015	0.40	4.00
Wachtmeister	SCM	—	Navy	—	O ..	—	—	—
Wale	SCA	—	Navy	—	O ..	—	—	—
Wasa	SBI	—	Navy	—	O ..	—	—	—
Wrangel	SCN	—	Navy	—	O ..	—	—	—
Yeddo [1]	SHF	350	Swedish East Asiatic Co. ..	300, 600	P ..	—[6]	0.40	4.00
Yngaren [5]	SHP	250	Rederiaktiebolaget Transatlantic	300, 600	P ..	—[4]	0.40	4.00
UNITED KINGDOM								
Aba [2]	GDSW	—	British and African S.N. Co., Ltd.	300, 600 2,100, 2,200 c.w.	P G ..	X	0.40	—
Abadesa [1]	ZAZ	180	Furness Houlder Argentine Lines, Ltd.	300, 600	P G ..	X	0.40	—
Abaris [1]	YJC	150	Gascony S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Abbassieh [1]	ZTH	—	Khedivial Mail S.S. & Graving Dock Co.	300, 600	P G ..	X	0.40	—
Aberdonian [12]	ZKS	135	Aberdeen S.N. Co.	300, 600	P G ..	X	0.40	—
Aberdeen [1]	LUT	150	Hindustan S.S. Co.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Aberlour [1]	EZR	150	Adam S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—

[1] Operated by the Marconi International Marine Communication Co., Ltd., London

[2] Operated by Siemens Bros. & Co., Ltd., Woolwich, London, S.E.

[3] Operated by the owners

[4] Operated by the Soc. Française Radio-Electrique

[5] Operated by Turnbull Martin & Co.

[6] Operated by Australian Navy

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.
UNITED KINGDOM—*contd.*							Francs.	Francs.
Abinsi [1]	MVP	220	African S.S. Co.	300, **600**, 2100[26], 2200[26]	P G	X	0.40	—
Absia [1]	OFA	150	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—
Acajutla [1]	ZHG	150	Pacific S. Navigation Co., Ltd.	300, **600**	P G	X	0.40	—
Acardo [1]	GFPB	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, **600**	P G	X	0.40	—
Acasta [1]	BQO	150	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—
Accrington [8]	GDMJ	—	Great Central Railway	300, **600**	P G	X	0.40	—
Achatina [1]	GFPD	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, **600**	P G	X	0.40	—
Achilles GDBC [1]	GDBC	—	Ocean S.S. Co., Ltd.	300, **600**	P G	X	0.40	—
Actor [1]	BOJ	135	Charente S.S. Co.	300, **600**	P G	X	0.40	—
Addington [1]	XFK	135	A. Morphy	300, **600**	P G	X	0.40	—
Admiral Cochrane [1]	YQX	135	Byron S.S. Co., Ltd.	300, **600**	P G	X	0.40	—
Admiral Codrington [1]	BOX	125	Wm. S. Arbuckle	300, **600**	P G	X	0.40	—
Admiral Hamilton [1]	GBQN	160	Byron S.S. Co., Ltd.	300, **600**	P G	X	0.40	—
Admiral Hastings [1]	GCDR	155	Byron S.S. Co., Ltd.	300, **600**	P G	X	0.40	—
Adna [1]	BPY	150	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—
A[illegible] [1]	YHL	155	English and American S.S. Co.	300, **600**	P G	X	0.40	—
Adriatic [1]	MHC	300	Oceanic S.N. Co.	300, **600**, 2100[26], 2200[26]	P G	N	0.40	—
Aeneas [1]	MFU	250	Ocean S.S. Co.	300, **600**, 2100[26], 2200[26]	P G	X	0.40	—
Afghanistan [1]	LUT	—	Hindustan Steam Shipping Co., Ltd.	300, **600**	P G	X	0.40	—
Africshire [1]	VNL	—	Mitchell Cotts & Co.	300, **600**	P G	X	0.40	—
Agadir GCQK [1]	GCQK	140	Royal Mail S.S. Co.	300, **600**	P G	N	0.40	—
Agamemnon ZJK [1]	ZJK	140	Ocean S.S. Co.	300, **600**	P G	X	0.40	—
Agapenor [1]	ZJP	220	Ocean S.S. Co.	300, **600**	P G	X	0.40	—
Agnes Duncan [1]	ZVW	—	Agnes Duncan S.S. Co., Ltd.	300, **600**	P G	X	0.40	—
Aguila [1]	EJF	180	Aguila S.S. Co.	300, **600**	P G	0600 to 0800, 0900 to 1200, 1400 to 1800, 2000 to 2200	0.40	—
Aldan [1]	MFM	200	Booth S.S. Co., Ltd.	300, **600**	P G	X	0.40	—
Ainsdale [1]	XIP	150	Alby United Carbide Factories, Ltd.	300, **600**	P G	X	0.15[21]	1.50[22]
Airedale [1]	OFT	150	C. A. Stewart & Co.	300, **600**	P G	X	0.40	—
Ajax [1]	GUZ	200	Ocean S.S. Co.	300, **600**	P G	X	0.40	—
Akaba [1]	[illegible]	170	British and African S. N. Co.	300, **600**	P G	X	0.40	—
Akenside [1]	GHWC	115	Quayside Shipping Co., Ltd.	300, **600**	[illegible]	X	[illegible]	[illegible]

Remarks:

[7] Operated by A. Holt & Co., Mgrs., Liverpool

[8] Operated by the Federal S.N. Co.

[9] Operated by Amalgamated Wireless (Australasia), Ltd.

[10] Operated by Melbourne Navy Board

[11] Operated by Comp. Française Maritime et Coloniale de Tel. sans Fils, Paris, for and on behalf of the Marconi International Marine Co., Ltd., London

[12] Operated by Canadian Government Radio-telegraph Service, Department of Naval Service, Ottawa

[13] Operated by Admiralty

[14] Operated by the Radio Corpn. of America

[15] Operated by the officers of the ship

[16] Private yacht

[17] Operated by Marconi Wireless Telegraph Co. of Canada, Ltd.

[18] Operated by the Marconi International Marine Communication Co., Ltd., on behalf of Amalgamated Wireless (Australasia), [illegible]

Akera[1]	OBS	—	[illegible] Co., Ltd.	300, 600	P G	X	0.40	—
Alatrium[1]	LUO	125	Rome S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Alaveno[1]	YHN	160	Atlantic & Eastern S.S. Co.	300, 600	P G	0700 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Alban[2]	GWW	225	Booth S.S. Co., Ltd.	300, 450, 600	P G	X	0.40	—
Albania GDLV[2]	GDLV	250	Cunard S.S. Co., Ltd.	300, 450, 600	P G	N	0.40	—
Albanian[1]	ZOI	180	F. Leyland & Co., Ltd.	300, 600	P G	N	0.40	—
Albany EXO[1]	EXO	135	Albany Steam Navigation Co., Ltd.	300, 450, 600	P G	X	0.40	—
Alberta YJT[1]	YJT	150	L. & S.W. Railway Co.	300, 600	P G	N	0.15[19]	1.50[19]
Albion[1]	GDQR	—	C. L. H. Loeffler, Esq.	300, 600	P	X	—	—
Albionstar[1]	GCBD	200	Blue Star Line, Ltd.	300, 600	P G	X	0.40	—
Albistan[1]	YFW	130	Pentaff S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Albuera[1]	LTM	150	Chr. Salvesen & Co.	300, 600	P G	X	0.40	—
Alcinous[1]	ZJQ	200	Ocean S.S. Co.	300, 600	P G	X	0.40	—
Alconda[1]	YSL	—	Anglo - Newfoundland Development Co.	300, 600	P G	X	0.40	—
Aldworth[1]	ZPF	130	J. Westoll	300, 600	P G	X	0.40	—
Alda	GBZQ	—	Pacific S.N. Co.	—	—	—	—	—
Aleppo[1]	ZVU	180	Ellerman's Wilson Line, Ltd.	300, 600	P G	0900 to 1300 1500 to 1800 2000 to 2300	0.40	—
Alert ZUE	ZUE	150	Cable Ship (General P.O.)	300, 600	P	—	0.05	0,50
Alesia[1]	ZQQ	180	India Office (mgrs., Grahams & Co.)	300, 600	P G	X	0.40	—
Alexandra YZH[1]	YZH	135	Woolston S.S. Co.	300, 600	P G	X	0.40	—
Alexandrian[1]	ZGM	180	F. Leyland & Co., Ltd.	300, 600	P G	N	0.40	—
Alfred Calvert[1]	BTU	130	Alfred Calvert (Shipping), Ltd.	300, 600	P G	X	0.40	—
Algeria[22]	GBPT	250	Anchor Line, Ltd.	300, 450, 600	P G	X	0.40	—
Algerian Prince[1]	GCMY	170	Prince Line, Ltd.	300, 600	P G	X	0.40	—
Algorta[1]	YFY	—	Vernco Steamship Co.	300, 600	P G	X	0.40	—
Alice Marie[8]	GDWX	100	Rodney Steamship Co., Ltd.	300, 600	P G	X	0.40	—
Alicia XFB[1]	XFB	125	T. G. Beatley & Son, Ltd.	300, 600	P G	X	0.40	—
Alipore[1]	GDCB	—	P. & O. S.N. Co.	300, 600	P G	X	0.40	—
Almagro[1]	GCKJ	—	MacAndrews & Co., Ltd.	300, 600	P G	X	0.40	—
Almanzora[1]	YZK	—	Royal Mail S.P. Co.	300, 600 2100[26], 2200[26]	P G	X	0.40	—
Almeria[1]	GBFD	155	Shipping Controller (mgrs., J. Gardner & Co.)	300, 600	P G	X	0.40	—
Alness[1]	GDTJ	175	Cornborough Shipping Line, Ltd.	300, 600	P G	X	0.40	—
Alpine Range[1]	YGH	140	Neptune S.N. Co.	300, 600	P G	X	0.40	—
Alster[1]	GBDL	—	Shipping Controller (mgrs., Turnbull Scott & Co.)	—	—	—	—	—
Alston[1]	YKH	140	Wm. Garthwaite	300, 600	P G	X	0.40	—
Altona[1]	GDFK	—	Allison Fullarton & Co.	300, 600	P G	X	0.40	—
Alvarado	GCKL	—	MacAndrews & Co.	300, 600	P G	X	0.40	—
Amalthus[1]	GFPC	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, 600	P G	X	0.40	—
Amarapoora[2]	GBKP	125	Burmah S.S. Co., Ltd.	300, 450, 600	P G	X	0.40	—
Amarna[1]	YRD	150	Moss S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Amasis[1]	YMT	160	Moss S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Amatonga[1]	ZPU	150	Ellerman & Bucknall S.S. Co.	300, 600	P G	X	0.40	—
Ambassador[1]	GXS	130	Hall Bros. S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Amber[8]	GFI	130	Eastern Telegraph Co.	300, 450, 600	P	X	0.40	—
Amberton[1]	ZVE	—	Carlton S.S. Co.	300, 600	P G	X	0.40	—
American Transport[1]	ZDP	140	Empire Transport Co.	300, 600	P G	X	0.40	—

[illegible] exchanged with coast stations of the United Kingdom, the coast charge is 17 centimes per word, minimum 1 fr. 70 centimes. In the case of radiotelegrams exchanged with French coast stations, the coast charge is 15 centimes per word without a minimum

[20] In the case of radiotelegrams exchanged with coast stations of the United Kingdom, the coast charge is 17 centimes per word, minimum 1 fr. 70 centimes.

[21] In the case of radiotelegrams exchanged with coast stations of the United Kingdom, the coast charge is 33 centimes per word, minimum 3 fr. 30 centimes

[22] Two motor lifeboats equipped with wireless telegraph apparatus are carried by this ship

[23] Normally employs 450 metre wavelength

[24] Normally employs 400 metre wavelength

[25] Operated by the S. A. Internationale de Télégraphie sans Fil

[26] Continuous wave

[27] Operated by the Tropical Radio Telegraph Co., Ltd.

[28] Operated by the Radio Communication Co., Ltd., London

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs	
UNITED KINGDOM—*contd.*									
Ampullaria [1]	GFPJ	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, **600**	P G ..	X	0.40	—	
Amsterdam [3]	GPF	130	Great Eastern Railway	300, 450, **600**[22]	P G ..	N	0.40	—	
Anamba [1]	ZAV	140	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Anatina [1]	BPW	150	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Anchises [1]	MFW	250	Ocean S.S. Co., Ltd.	300, **600** 2100[26], 2200[26]	P G ..	X	0.40	—	
Anchoria [1]	YDE	180	T. & J. Brocklebank, Ltd. ..	300, **600**	P G ..	X	0.40	—	
Anchorton [1]	GDWL	125	Anglo-Commercial Shipping Co., Ltd.	300, 450, **600**	P G ..	X	0.40	—	
Ancobra [1]	YMK	160	African S.S. Co.	300, **600**	P G ..	X	0.40	—	
Ancula [1]	ELL	—	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Andalusian [1]	XIC	130	Ellerman's Lines, Ltd.	300, **600**	P G ..	X	0.40	—	
Andalusier [1]	GDPF	—	Lloyd Royal Belge (Gt. Britain), [Ltd.	300, **600**	P G ..	X	0.40	—	
Andes MRQ [1]	MRQ	200	Royal Mail S.P. Co. ..	300, **600** 2100[26], 2200[26]	P G ..	N	0.40	—	
Andorinha [1]	MIU	130	Andorinha S.S. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Andrée [1]	ENN	350	Green Star Shipping Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Anglesea [1]	BCR	120	Cardigan S.S. Co., Ltd. (mgrs. Jenkins Bros.)	300, **600**	P G ..	X	0.40	—	
Anglia GCMK [3] ..	GCMK	—	London & N. Western Rly. Co. ..	300, **600**	P G ..	N	0.40	—	
Anglier [1]	YAG	125	Lloyd Royal Belge	300, **600**	P G ..	X	—	—	
Anglo-Chilean [1] ..	ZRS	170	Nitrate Producers S.S. Co., Ltd...	300, **600**	P G ..	N	0.40	—	
Anglo-Egyptian [1] ..	YUM	160	Nitrate Producers S.S. Co., Ltd...	300, **600**	P G ..	X	0.40	—	
Anglo-Mexican [1] ..	YYC	140	Nitrate Producers S.S. Co., Ltd...	300, **600**	P G ..	N	0.10	—	
Anglo-Saxon [1]	GUB	140	Nitrate Producers S.S. Co., Ltd...	300, **600**	P G ..	N	0.40	—	
Angora [1]	GCQR	220	British India S.N. Co.	300, **600**	P G ..	X	0.40	—	
Anhalt [1]	GDFY	—	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Anne [1]	GCSX	—	Shipping Controller (F. C. Strick & Co., Ltd.)	300, **600**	P G ..	X	—	—	
Anomia [1]	BQM	140	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Anselm [1]	MDK	180	Booth S.S. Co., Ltd.	300, **600** 2100[26], 2200[26]	P G ..	X	0.40	—	
Anselma de Larrinaga [1]	EJR	180	Anselma de Larrinaga S.S. Co., Ltd.	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Anagir [1]	GDKF	—	Gow, Harrison & Co.	300, **600**	P G ..	X	0.40	—	
Answald [1]	GBYL	—	Cunard S.S. Co.	—	—	—	—	—	
Antigone EUA [3] ..	EUA	130	Egypt & Levant S.S. Co., Ltd. ..	300, **600**	P G ..	X	0.40		

Antillian[1]	MJL	200	F. Leyland & Co., Ltd.	300, 600	P G	..	N	0.40	—
Antilochus[1]	GTC	140	Ocean S.S. Co., Ltd.	300, 450, 600	P G	..	X	0.40	4.00
Antinoe[1]	GDMR	—	Egypt & Levant S.S. Co., Ltd...	300, 600	P G	..	X	0.40	—
Antinous[1]	ZCN	135	Egypt & Levant S.S. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Antiope[1]	GMX	—	Egypt & Levant S.S. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Antrim GPN[8]	GPN	150	Midland Railway Co.	300, 400, 600[24]	P G	..	N	0.40	—
Antwerp[8]	GDFV	—	Great Eastern Railway Co. ..	300, 450, 600	P G	..	N	0.10[20]	1.00[20]
Antwerpen[1]	GBMP	130	Shipping Controller (W. A. Young & Co.)	300, 600	P G	..	X	0.40	—
Apollo GXC[1]	GXC	160	Bolivian General Enterprise, Ltd.	300, 600	P G	..	X	0.40	—
Appalachee GCQS[1] ..	GCQS	140	Anglo-American Oil Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Appam[1]	GDJ	250	British & African S.N. Co., Ltd...	300, 600, 2100[26], 2200[26]	P G	..	X	0.40	—
Applebranch[1]	GCND	—	Nautilus S.S. Co...	300, 600	P G	..	X	0.40	—
Appleleaf[1]	ZVI	200	Lane & MacAndrew, Ltd. ..	300, 600	P G	..	X	0.40	—
Apsley[1]..	EUQ	145	Fawcett, Coverdale & Co. ..	300, 600	P G	..	X	0.40	—
Apsleyhall[1]	BCZ	150	West Hartlepool S.N. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Aquitania[1][22]	MSU	500	Cunard S.S. Co., Ltd.	300, 600, 2100[26], 2200[26]	P G	..	N	0.40	—
Arabian Prince[1] ..	XIY	150	Prince Line, Ltd.	300, 600	P G	..	X	0.40	—
Arabic[1]..	GCRM	—	Oceanic Steam Nav. Co., Ltd. ..	300, 450, 600	P G	..	N	0.40	—
Arabier[1]	EOL	150	Lloyd Royal Belge (Gt. Britain)..	300, 600	P G	..	X	0.40	—
Arabistan[1]	ZMA	150	F. C. Strick & Co., Ltd.	300, 600	P G	..	X	0.40	—
Arachne[1]	YAV	150	Gordon S.S. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Arafura[1]	GBFV	—	Eastern and Australian S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Aragaz[1]	ZZR	135	Aragaz Tank S.S. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Araguaya[1]	MBG	160	Royal Mail Steam Packet Co. ..	300, 600	P G	..	N	0.40	—
Arakaka[1]	GUA	140	Booker Bros., MacConnell & Co...	300, 600	P G	..	X	0.40	—
Aral[1]	ZVF	135	Aral S.S. Co.	300, 600	P G	..	X	0.40	—
Arana[1]..	GCKF	115	MacAndrew & Co., Ltd.	—	P G	..	X	—	—
Arankola GCQT[1] ..	GCQT	180	British India S.N. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Aras[1]	YZP	120	Petroleum S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Arawa[1]	MWE	200	Shaw, Savill & Albion Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Arbonne[1]	GDRT	—	Steven Line, Ltd...	300, 600	P G	..	X	0.40	—
Archangel[8]	ZCP	120	Great Eastern Railway	300, 450, 600[22]	P G	..	N	0.10[20]	1.00[20]
Archimedes[1]	YQC	170	Liverpool, Brazil and River Plate S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Architect[1]	ZHH	180	Charente S.S. Co...	300, 600	P G	..	X	0.40	—
Ardena GDPN[1] ..	GDPN	200	London and South-Western Railway Co.	300, 450, 600	P G	..	N	0.10[19]	1.00[19]
Ardenza[1]	GDQY	120	Steven Line, Ltd...	300, 600	P G	..	X	0.40	—
Ardeola[1]	GCJ	180	Ardeola S.S. Co.	300, 600	P G	..	X	0.40	—
Ardgowan[1]	XMY	130	Ard. Steamers, Ltd.	300, 600	P G	..	X	0.40	—
Ardmore GFCW[1] ..	GFCW	—	Coast Lines, Ltd.	300, 600	P G	..	X	0.10[20]	1.00[20]
Ardover[1]	GBXR	—	David S.S. Co., Ltd.	300, 450, 600	P G	..	X	0.40	—
Ardoyne[1]	YND	140	Stella Shipping Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Argalia[1]	XLH	—	Donaldson Line, Ltd.	300, 600	P G	..	X	0.40	—
Argonauta[1]	YAA	150	Anglo-Saxon Petro. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Argyllshire[5]	GTJ	220	Scottish Shire Line, Ltd. ..	300, 450, 600	P G	..	0900 to 1230, 1300 to 1400, 1600 to 1800, 2000 to 2100	0.40	—
Ariadne Alexandra[1] ..	LUA	—	Alexander Shipping Co., Ltd. ..	300, 600	P G	..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Ariadne Irene[1] ..	EUS	130	Ariadne S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Ariano[1]	YFG	—	Gulf Line, Ltd.	300, **600**	P G ..	X	0.40	—	
Ariosto	ZJB	—	Ellerman's Wilson Line, Ltd. ..	300, **600**	P G ..	0900 to 1300 1500 to 1800 2000 to 2300	0.40	—	
Arlanza[1]	GCQV	280	Royal Mail S.P. Co.	300, **600** 2100[20], 2200[20]	P G ..	N	0.40	—	
Armadale Castle[1] ..	MQG	240	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G ..	N	0.40	—	
Armagh[10]	BMZ	200	Union S.S. of New Zealand, Ltd.	300, **600**	P G ..	N	0.40	—	
Arncliffe[1]	GXX	150	Care & Marquand Shipping Co. ..	300, **600**	P G ..	X	0.40	—	
Aronda[1]	MAZ	220	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Arracan[8]	GWO	180	British & Burmese S.N. Co., Ltd.	300, 450, **600**	P G ..	1000 to 1200 1400 to 1600 2000 to 2400	0.40	—	
Arranmead[1]	YID	—	Western Counties Shipping Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Arta[1]	GDFJ	—	Bell Brothers & Co	300, **600**	P G ..	X	0.40	—	
Artemisia[1]	GBDC	—	Rankin, Gilmour & Co. ..	300, **600**	P G ..	X	0.40	—	
Arundel MDZ[8] ..	MDZ	135	London, Brighton & S. Coast Railway	300, **600**	P G ..	N	0.15[19]	1.50[19]	
Arundel Castle[1] ..	GCZL	—	Union Castle Mail S.S. Co. ..	300, **600** 2100[20], 2200[20]	P G ..	N	0.40	—	
Arvonia GRG[8] ..	GRG	150	London & N.W. Railway, Co...	300, **600**	P G ..	N	0.05[20]	0.50[20]	
Arzila[1]	GCQW	150	Royal Mail Steam Packet Co. ..	300, **600**	P G ..	N	0.40	—	
Ascanius[1]	MFV	200	Ocean S.S. Co., Ltd.	300, **600** 2100[20], 2200[20]	P G ..	N	0.40	—	
Ascot[1]	MKZ	135	British S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Ashanti[1]	ESK	160	Elder Line, Ltd.	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Ashtabula GKC[1] ..	GKC	150	Anglo-American Oil Co.	300, **600**	P G ..	X	0.40	—	
Ashwin[1]	ZQX	150	Ashwin & Co.	300, **600**	P G ..	X	0.40	—	
Ashworth[1]	GDPM	—	Dalgliesh Steam Shipping Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Asian[1]	MKL	200	F. Leyland & Co., Ltd.	300, **600**	P G ..	N	0.40	—	
Asiatic[1]	GUX	130	Stella S.S. Co., Ltd.	300, **600**	P O ..	X	0.40	—	
Assaye[1]	MOO	155	P. & O. S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Assiout[1]	ERL	150	Moss S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	

Assyria [26]	GBJP	150	Anchor Line, Ltd.	300, 450, 600	P G	X	0.40	—
Assyrian [1]	GCVK	—	Ellerman Lines, Ltd.	300, 600	P G	X	0.40	—
Astraea [1]	MOX	144	Cardiff S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Astrakhan YBG [1]	YBG	—	Astrakhan S.S. Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Astronomer [1]	LUY	160	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Asturian [1]	EMG	150	Ellerman's Lines, Ltd.	300, 600	P G	X	0.40	—
Asturias	MBB	250	Glover Bros.	300, 600	P G	N	0.40	—
Astyanax [1]	ZKF	150	China Mutual S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Asuncion de Larrinaga [1]	EMB	150	Miguel de Larrinaga, S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Athenia [1]	GFDM	—	Anchor Donaldson, Ltd.	300, 450, 600	P G	X	0.40	—
Athenic MWN [1]	MWN	200	Oceanic S.N. Co.	300, 600	P G	X	0.40	—
Athenic ZUL [1]	ZUL	150	Anglo-Belgique Shipping Co.	300, 600	P G	X	0.40	—
Atholl [1]	EVY	170	J. Warrack and Co.	300, 600	P G	X	0.40	—
Atlanten [1]	XMR	—	Elder Dempster & Co., Ltd.	300, 600	P G	X	0.40	—
Atlantic YLJ [1]	YLJ	125	W. H. Cockerline	300, 600	P G	X	0.40	—
Atlantic City [1]	GDRN	—	St. Just S.S. Co.	300, 600	P G	X	0.40	—
Atreus [1]	ZKG	180	China Mutual S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Atta [1]	GBKW	—	J. Gardner & Co.	300, 600	P G	X	0.40	—
Atua [9]	GDZR	325	Union Steamship Co. of New Zealand	300, 600	P G	X	0.20	—
August Wilke [1]	GBZK	130	Burdick & Cook	—	—	—	—	—
Auguste Halenke [1]	EXN	130	J. MacKelvie & Co.	300, 600	P G	X	0.40	—
Auldmuir [1]	XEL	130	Admiral Shipping Co.	300, 600	P G	X	0.40	—
Aungban [1]	YFI	180	Burmah Oil Co.	300, 600	P G	X	0.40	—
Australia YSN [1]	YSN	160	British India S.N. Co.	300, 600	P G	X	0.40	—
Australier XJU [1]	XJU	—	Lloyd Royal Belge (Great Britain)	300, 600	P G	X	0.40	—
Australind [8]	GQW	250	Australind S.S. Co.	300, 600	P G	0915 to 1300 1630 to 2400	0.40	—
Austria [1]	GBMT	—	F. & W. Ritson	300, 600	P G	X	0.40	—
Austrian [1]	EMH	130	Ellerman's Lines, Ltd.	300, 600	P G	X	0.40	—
Author [1]	YIN	—	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Ave Maria [1]	GDFX	—	Mesopotamian Minerals and Plantations Co., Ltd.	300, 600	P G	X	0.40	—
Avon [1]	MBO	160	Royal Mail S.P. Co.	300, 600 2100[36], 2200[36]	P G	N	0.40	—
Avonmede [1]	EPW	—	Mede Line, Ltd.	300, 600	P G	X	0.40	—
Avontown [1]	GFCB	—	Town Line (London), Ltd.	300, 600	P G	X	0.40	—
Aylesbury [1]	MRJ	140	Alexandra S.S. Co.	300, 600	P G	X	0.40	—
Aylestone [1]	ZJX	140	Aylestone S.S. Co.	300, 600	P G	X	0.40	—
Aymeric [1]	GBJV	180	Bank Line, Ltd.	300, 600	P G	X	0.40	—
Ayrshire [5]	GQA	220	Scottish Shire Line, Ltd.	300, 450, 600	P G	0900 to 1230 $13^{\circ\circ}$ to 1400 1600 to 1800 2000 to 0100	0.40	—
Azeus [1]	GDSP	—	C. Doresa & Co.	300, 600	P G	X	0.40	—
Backworth [1]	GCBZ	—	Robert Stanley Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Badagry [1]	YEC	—	Elder Dempster & Co., Ltd.	300, 600	P G	X	0.40	—
Badenia [1]	GBZD	—	A. Holt & Co.	300, 600	P G	X	0.40	—
Bahadur [2]	XTK	155	Asiatic S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Bahia Castello [1]	GBSC	—	G. Thompson & Co.	300, 600	P G	X	0.40	—
Bakana [1]	YCQ	—	Elder Dempster & Co., Ltd.	300, 600	P G	X	0.40	—
Balderton [1]	GDQC	—	Anglo-Commercial Shipping Co., Ltd.	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Baldina[1]	XXE	—	Adelaide S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Balfe	GCQB	—	Lamport & Holt, Ltd.	300, **600**	P G	X	0.40	—	
Ballarat[1]	GFBL	—	P. & O. S.N. Co.	300, **600**	P G	N	0.40	—	
Ballycotton[1]	GFLW	—	Clyde Shipping Co., Ltd.	300, 450, **600**	P G	X	0.10[20]	1.00[20]	
Ballygally Head[1]	GBRK	170	G. Heyn & Co.	300, **600**	P G	X	0.40	—	
Balmoral[1]	GFQP	—	Southampton, Isle of Wight, and South of England R.M.S.P. Co., Ltd.	300, **600**	P G	N	0.10[26]	1.00[29]	
Balmoral Castle[1]	MPW	250	Union Castle Mail S.S. Co., Ltd.	300, **600** 2100[26], 2200[26]	P G	N	0.40	—	
Balranald[1]	GFBM	—	P. & O. S.N. Co.	300, **600**	P G	N	0.40	—	
Baltabor[3]	GDLB	—	United Baltic Corporation, Ltd.	300, **600**	P G	X	0.15[21]	1.50[21]	
Baltamar[3]	GDXK	250	United Baltic Corporation, Ltd.	300, 450, **600**	P G	N	0.40	—	
Baltannic[3]	GDWM	200	United Baltic Corporation, Ltd.	300, **600**	P G	X	0.15[21]	1.50[21]	
Baltic MBC[1]	MBC	180	Oceanic S.N. Co.	300, **600** 2100[26], 2200[26]	P G	N	0.40	—	
Baltriger[3]	GDXC	150	United Baltic Corporation, Ltd.	300, **600**	P G	N	0.15[21]	1.50[21]	
Baluchistan[1]	YXK	130	Hindustan S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Balzac	GCSZ	—	—	300, **600**	P G	X	0.40	—	
Bamora[1]	MST	180	British India S.N. Co.	300, **600**	P G	X	0.40	—	
Bampton[1]	LSQ	130	Medit. Cargo Steamers, Ltd.	300, **600**	P G	X	0.40	—	
Bampton Castle[1]	YBF	—	Union-Castle Mail S.S. Co.	300, **600**	P G	X	0.40	—	
Banca[1]	MFS	170	P. & O. S.N. Co.	300, **600**	P G	X	0.40	—	
Banchory[1]	ZQS	125	Globe Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Bandon[1]	GDVL	—	Coast Lines, Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
Bandra[1]	MCH	185	British India S.N. Co.	300, **600**	P G	X	0.40	-	
Banffshire[3]	GVM	125	Scottish Shire Line, Ltd.	300, **600**	P G	X	0.40	—	
Bangala[1]	GAC	180	British India S.N. Co.	300, **600**	P G	X	0.40	-	
Bankdale[4]	ENF	250	Mondrich S.S. Co.	300, **600**	P G	X	0.40	—	
Bankura[1]	GCH	160	British India S.N. Co.	300, **600**	P G	X	0.40	—	
Baraccoo[1]	YEF	—	Elder Dempster & Co., Ltd.	300, **600**	P G	X	0.40	—	
Baradine[1]	GFBN	—	P. & O. S.N. Co.	300, **600**	P G	N	0.40	—	
Barala[1]	GCM	170	British India S.N. Co.	300, **600**	P G	X	0.40	—	
Barbadian[1]	GBQM	180	F. Leyland & Co., Ltd.	300, **600**	P G	X	0.40	—	
Bardic[1]	BEM	170	Oceanic S.N. Co.	300, **600**	P G	X	0.40	—	
Barima[1]	ZNB	125	Royal Mail Steam Packet Co.	300, **600**	P G	X	0.40	—	
Barjora[1]	GCT	175	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Barlby[1]	BTT	130	Sir R. Ropner & Co., Ltd.	300, **600**	P G	X	0.40	—	
Barmoor[1]	EZX	—	[illegible]	300, **600**	P G	X	0.15[21]	1.50[21]	

Baroda [1]	GDL	180	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Baron Ailsa [1]	XES	170	H. Hogarth & Sons	300, 600	P G	X	0.40	—
Baron Ardrossan [1]	MWW	160	H. Hogarth & Sons	300, 600	P G	X	0.40	—
Baron Berwick [1]	MSS	130	Kelvin Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Baron Blantyre [1]	XLN	—	H. Hogarth & Sons	—	—	—	—	—
Baron Cathcart [1]	ZRI	125	Kelvin Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Baron Cawdor [1]	GBTZ	—	Hogarth Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Baron Douglas [1]	ODD	—	Kelvin Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Baron Elcho [1]	ZPP	150	H. Hogarth & Sons	300, 600	P G	X	0.40	—
Baroness [1]	ZQA	120	Furness Houlder Argentine Lines, Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	—	—
Baron Fairlie [1]	LUZ	185	H. Hogarth & Sons	300, 600	P G	X	0.40	—
Baron Garioch [1]	GBNC	175	H. Hogarth & Sons	300, 600	P G	X	0.40	—
Baron Inchcape [1]	BAU	185	H. Hogarth & Sons	300, 600	P G	X	0.40	—
Baron Jedburgh [1]	MGD	180	H. Hogarth & Sons	300, 600	P G	X	0.40	—
Baron Kelvin [1]	EOT	125	Kelvin Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Baron Minto [1]	YEK	185	H. Hogarth & Sons	300, 600	P G	X	0.40	—
Baron Napier [1]	MJS	165	H. Hogarth & Sons	300, 600	P G	X	0.40	—
Baron Polwarth [1]	GRB	185	H. Hogarth & Sons	300, 600	P G	X	0.40	—
Baron Renfrew [1]	ZOQ	120	Kelvin Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Baron Sempill [1]	ZFP	150	Kelvin Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Barotse [1]	ZPR	130	Ellerman Bucknall S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Barpeta [1]	MPR	170	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Barrabool [1]	GFBP	—	P. & O. S.N. Co.	300, 600	P G	N	0.40	—
Barracoo [1]	YEF	—	Elder, Dempster & Co.	300, 600	P G	X	0.40	—
Barranca MLL [1]	MLL	135	Elders & Fyffes, Ltd.	300, 600	P G	X	0.40	—
Barrymore [1]	—	—	Johnston Line, Ltd.	—	—	—	—	—
Bassa [1]	YYJ	130	Elder Dempster & Co., Ltd.	300, 600	P G	X	0.40	—
Bassam [1]	ZMJ	—	British and African S.N. Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Bassano [1]	YQA	155	Ellerman's Wilson Line, Ltd.	300, 600	P G	0900 to 1300 1500 to 1800 2000 to 2300	0.40	—
Bata [1]	GBST	180	African S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Batanga [1]	YEB	155	British and African S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Bathurst [1]	GBPM	120	Elder Dempster & Co., Ltd.	300, 600	P G	X	0.40	—
Batsford [1]	ZXL	170	Canadian Pacific Ocean Services, Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Bavarian [1]	ZTU	135	Ellerman Lines, Ltd.	300, 600	P G	X	0.40	—
Bayano [1]	GMK	200	Elders & Fyffes, Ltd.	300, 600	P G	X	0.40	—
Baychimo [1]	GDWK	—	Hudson's Bay Company	2100[34], 2200[34] 300, 450, 600	P G	X	0.40	—
Baycross [1]	ZVZ	155	The Bay S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Baydouglas [1]	ETU	170	The Bay S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Bayford [1]	BEL	185	The Bay S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Baygola [1]	ZXW	170	The Bay S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Baygowan [1]	ZVY	155	The Bay S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Bayhowel [1]	LUW	155	The Bay S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Baylula [1]	BAF	170	The Bay S.S. Co., Ltd.	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs	Francs.	
UNITED KINGDOM—*contd.*									
Baymano[1]	YHX	155	The Bay S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Baymanter[1]	BAD	170	The Bay S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Baymingo[1]	YHP	155	The Bay S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Bayramento[1]	YCW	150	The Bay S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Baysarnia[1]	YNW	155	The Bay S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Baysarua[1]	EQO	160	The Bay S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Baytigern[1]	ESP	185	The Bay S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Bayverdun[1]	ZXX	170	The Bay S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Beacon Grange[1]	GCQL	185	Houlder Line, Ltd.	300, **600**	P G	X	0.40	—	
Bearwood[1]	GFCD	135	Wm. France, Fenwick & Co., Ltd.	300, **600**	P G	X	0.15[21]	1.50[21]	
Beaverton	XTO	—	Canada S.S. Lines, Ltd.	300, **600**	P G	X	—	—	
Beckenham[1]	EWU	—	Britain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Beechleaf[1]	EZG	185	Anglo-Saxon. Pet. Co., Ltd.	300, **600**	P G	X	0.40	—	
Beechpark[1]	GCBR	—	J. & J. Denholm	300, **600**	P G	X	0.40	—	
Beechwood[1]	YAE	185	Beechwood S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Belgian[1]	GCNM	200	Leyland Line	300, **600**	P G	X	0.40	—	
Belgic[1]	ZXC	200	International Nav. Co., Ltd.	300, **600**	P G	N	0.40	—	
Beldina[1]	XXE	—	Adelaide S.S. Co.	300, **600**	P G	X	0.40	—	
Belgravian[1]	OEK	130	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
Belize[1]	BEO	120	Royal Mail Steam Packet Co.	300, **600**	P G	X	0.40	—	
Bellerby[1]	ESY	130	Sir R. Ropner & Co.	300, **600**	P G	X	0.40	—	
Bellerophon[1]	GTD	120	Ocean S.S. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Bellfield[1]	YDZ	135	Keighley Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Bellglade[1]	BKR	—	Peterborough Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Belltown[1]	ZCD	135	Keighley Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Beltana[1]	MKR	175	P. & O. Steam N. Co.	300, **600**	P G	X	0.40	—	
Bembridge[1]	YKX	150	J. Temperley	300, **600**	P G	X	0.40	—	
Benalder[1]	ENS	200	Wm. Thomson & Co.	300, **600**	P G	X	0.40	—	
Benalla[1]	GBJ	220	P. & O. S.N. Co.	300, **600**	P G	X	0.40	—	
Benarty[1]	YLT	220	W. Thomson & Co.	300, **600**	P G	X	0.40	—	
Benavon[1]	EJD	200	W. Thomson & Co.	300, **600**	P G	X	0.40	—	
Bencleuch[1]	ZZA	200	W. Thomson & Co.	300, **600**	P G	X	0.40	—	
Bendigo[1]	GFBQ	—	P. & O. S.N. Co.	300, **600**	P G	N	0.40	—	
Bendoran[1]	YEM	200	W. Thomson & Co.	300, **600**	P G	X	0.40	—	
Bendu[1]	ZME	185	Elder Line	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Benedict[1]	ZKY	170	Booth S.S. Co., Ltd.	300, **600**	P G	X	0.40		

Benefactor[1]	MOE	185	Charente S.S. Co.	300, 600	P G	X	0.40	—
Bengloe[1]	YVA	—	Wm. Thomson & Co.	300, 600	P G	X	0.40	—
Benguela[1]	ZMQ	—	Imperial Direct Line, Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Benin[1]	ZMR	170	Imperial Direct Line, Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Benlawers	YJS	200	W. Thomson & Co.	300, 600	P G	X	0.40	—
Benledi[1]	YLU	200	W. Thomson & Co.	300, 600	P G	X	0.40	—
Benlomond[1]	LTC	200	W. Thomson & Co.	300, 600	P G	X	0.40	—
Ben mohr[1]	BDO	135	W. Thomson & Co.	300, 600	P G	X	0.40	—
Ben Nevis[1]	GYX	130	Watson Bros.	300, 600	P G	X	0.40	—
Benrinnes[1]	EKC	200	W. Thomson & Co.	300, 600	P G	X	0.40	—
Benue[1]	ZMF	155	African S.S. Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Benvenue[1]	EPQ	185	W. Thomson & Co.	300, 600	P G	X	0.40	—
Ben Voilich[1]	GCFB	—	W. Thomson & Co.	300, 600	P G	X	0.40	—
Benwood[1]	YCA	155	London American Maritime Trading Co.	300, 600	P G	X	0.40	—
Berbice[1]	GIF	155	Royal Mail Steam Packet Co.	300, 600	P G	X	0.40	—
Bereby[1]	YDC	170	Elder Dempster & Co.	300, 600	P G	X	0.40	—
Berkut[1]	GBTR	—	Ornis S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Bermuda[2]	GBDJ	—	Lawther, Latta & Co.	300, 600	P G	X	0.40	—
Bernini[1]	XFE	150	Lamport & Holt, Ltd.	300, 600	P G	X	0.40	—
Berriedale[1]	LUI	170	Albiana S.S. Co.	300, 600	P G	X	0.40	—
Berrima[1]	YWR	220	P. & O. S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Berwickshire[1]	YZS	170	Scottish Shire Line, Ltd.	300, 600	P G	X	0.40	—
Berwindvale[1]	GCQX	155	Berwindvale S.S. Co., Ltd	300, 600	P G	X	0.40	—
Betwa[1]	BDZ	190	James Nourse, Ltd.	300, 600	P G	X	0.40	—
Bhamo[2]	GWA	125	Burmah S.S. Co., Ltd.	300, 600	P G	1000 to 1200 1600 to 1800 2000 to 2400	0.40	—
Bharata	GAD	200	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Biafra[1]	YCF	180	Elder Dempster & Co., Ltd.	300, 600	P G	X	0.40	—
Biarritz[2]	EZN	—	S.E. & Chatham Rly. Co.	300, 600	P G	—	0.40	—
Bideford[1]	BOA	145	North Wales Shipping Co. Ltd.	300, 600	P G	X	0.40	—
Biela[1]	YNC	140	Lamport & Holt, Ltd.	300, 600	P G	X	0.40	—
Bilbster[1]	BUC	145	Canada S.S. Lines, Ltd.	300, 600	P G	X	0.40	—
Binfield[1]	GRMV	170	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Bisley[1]	YCB	—	Romney S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Bithina[1]	YJX	—	Anglo-Saxon Petroleum Co., Ltd.	300, 600	P G	X	0.40	—
Bittern GBXQ[1]	GBXQ	—	Cork Steamship Co., Ltd.	300, 600	P G	X	0.05[20]	0.50[20]
Blackheath[1]	EWW	120	Britain S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Blackhill[1]	BCC	—	Consett Iron Co.	300, 600	P G	X	0.15[21]	1.50[21]
Black Prince[1]	YIB	150	Prince Line Ltd.	300, 600	P G	X	0.40	—
Black Sea[1]	GDLW	—	British Black Sea Shipping and Oil Co., Ltd.	300, 600	P G	X	0.40	—
Blackwell[1]	ZLC	170	Well Line, Ltd.	300, 600	P G	0800 to 1200 1400 to 1800 2000 to 2400	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge.		Remarks.
							Per Word.	Minimum per Radio-telegram.	
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Blairmore[1]	BOB	145	Northern Nav. Co., Ltd.	300, **600**	P G	X	0.40	—	
Bloemfontein[1]	GBN	150	Ellerman & Bucknall S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Bloomfield[1]	LSU	135	Hunting S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Bodnant[1]	YCO	—	Elder Dempster & Co., Ltd.	300, **600**	P G	X	0.40	—	
Bogota[1]	YAC	180	Pacific Steam N. Co.	300, **600**	P G	X	0.40	—	
Bohemian[1]	MEL	150	F. Leyland & Co., Ltd.	300, **600**	P G	N	0.40	—	
Bokana[1]	YCQ	—	Elder, Dempster & Co., Ltd.	300, **600**	P G	X	0.40	—	
Bolingbroke[1]	BGE	170	Canadian Pacific Railway Co.	300, **600**	P G	X	0.40	—	
Bolivian[1]	GCNB	—	F. Leyland & Co., Ltd.	300, **600**	P G	X	0.40	—	
Bolton Abbey[1]	GBRV	—	David S.S. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Bolton Castle[1]	MAQ	150	Lancashire Shipping Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Boma[1]	GBSV	—	Elder, Dempster & Co., Ltd.	300, **600**	P G	X	0.40	—	
Bompata[1]	GFCV	—	British and African S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Bonheur[20]	GCTS	300	Lamport & Holt, Ltd.	300, 450, **600**	P G	N	0.40	—	
Bonny[1]	XIN	160	Elder Dempster & Co., Ltd.	300, **600**	P G	X	0.40	—	
Borda[1]	MFQ	220	P. & O. S.N. Co.	300, **600**	P G	X	0.40	—	
Borde[1]	GFMR	—	Stephenson Clarke & Co.	300, 450, **600**	P G	X	0.10[20]	1.00[20]	
Borderer[1]	GCL	150	Barcelona S.S. Co.	300, **600**	P G	X	0.40	—	
Borderland[1]	MUM	—	Leith, Hull & Hamburg S.S.Co.	300, **600**	P G	X	0.40	—	
Borelis[1]	GCWM	175	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Borodino[1]	ODT	—	Ellerman's Wilson Line, Ltd	300, **600**	P G	X	0.40	—	
Borulos[1]	GFJN	—	Khedivial Mail S.S. & Graving Dock Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Boscombe Chine[1]	XEG	150	Thordis Shipping Co. Ltd.	300, **600**	P G	X	0.40	—	
Bosnian[1]	OEL	120	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
Boston City[1]	GDSB	—	C. Hill & Sons	300, **600**	P G	X	0.40	—	
Boswell[1]	GCTV	—	Lamport & Holt, Ltd.	300, **600**	P G	X	0.40	—	
Bosworth YJM[1]	YJM	—	Canadian Pacific Railway Co.	300, **600**	P G	X	0.40	—	
Bothwell BMK[1]	BMK	—	Canadian Pacific Railway Co.	300, **600**	P G	X	0.40	—	
Boukadra[1]	YGB	145	La Tunne S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Boulama[1]	YMJ	160	British & African S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Bourne[1]	GBCS	—	David S.S. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Bournemouth[1]	ZJD	145	Leeston Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Boutry[1]	YCZ	—	Elder Dempster & Co., Ltd.	300, **600**	P G	X	0.40	—	
Boveric[1]	YNY	135	Bank Line, Ltd.	300, **600**	P G	X	0.40	—	
Boverton[1]	XHK	145	Gwenllian Thomas S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	

Ship	Call sign	Power	Owner	Wavelengths	Service		Hours	Rate	Rate
Bovic[1]	GDO	210	Oceanic S.N. Co.	300, 600	P G		X	0.40	—
Boyne[1]	ZUY	145	Mercantile S.S. Co.	300, 600	P G		X	0.40	—
Brabandier[1]	EUM	140	Lloyd Royal Belge (Great Britain) Ltd.	300, 600	P G		X	0.40	—
Bradavon[1]	XLG	160	Leeds Shipping Co., Ltd.	300, 600	P G		X	0.40	—
Bradburn[1]	ETY	—	Leeds Shipping Co., Ltd.	300, 600	P G		X	0.40	—
Bradclyde[1]	YRB	150	Leeds Shipping Co., Ltd.	300, 600	P G		X	0.40	—
Bradford City[1]	GBCL	150	St Just S.S. Co., Ltd.	300, 600	P G		X	0.40	—
Braemar Castle[1]	GCQZ	260	Union-Castle Mail S.S. Co., Ltd.	300, 600	P G		X	0.40	—
Brambleleaf[1]	ZZQ	—	Lane & Macandrew, Ltd.	300, 600	P G		X	0.40	—
Brandenburg GBSF[1]	GBSF	—	A. Holt & Co.	300, 600	P G		X	0.40	—
Branksome Hall[1]	GBFQ	—	Hall Line, Ltd.	300, 600	P G		X	0.40	—
Brant County[1]	GBYT	—	John Coull & Sons	300, 600	P G		X	0.40	—
Bratton Castle[1]	YAN	—	Union Castle Mail S.S. Co., Ltd.	300, 600	P G		X	0.40	—
Braunfels[1]	BPG	—	Grahams & Co.	300, 600	P G		X	0.40	—
Braywood[1]	GDTK	125	Wm. France Fenwick & Co., Ltd.	300, 600	P G		X	0.15[21]	1.50[21]
Brazilier[1]	OET	150	Lloyd Royal Belge (Great Britain)	300, 600	P G		X	0.40	—
Breconian[1]	YEW	120	Tyneside Line, Ltd.	300, 600	P G		X	0.40	—
Bremen[1]	GBJK	—	P. & O. S.N. Co.	300, 600	P G		X	0.40	—
Brendon[1]	BEK	135	Medit. Cargo Steamers, Ltd.	300, 600	P G		X	0.40	—
Brescia ESS[1]	ESS	165	Cunard S.S. Co., Ltd.	300, 600	P G		X	0.40	—
Breslau[1]	GFCN	—	Leith, Hull & Hamburg S.P. Co., Ltd.	300, 600	P G		X	0.15[21]	1.50[21]
Bretanier[1]	EXP	140	Lloyd Royal Belge (Great Britain) Ltd.	300, 600	P G		X	0.40	—
Bretwalda[1]	GBJR	170	Hall Bros. S.S. Co.	300, 600	P G		X	0.40	—
Breynton[1]	LSZ	145	Globe Shipping Co, Ltd.	300, 600	P G		X	0.40	—
Briarleaf[1]	EYA	200	Anglo-Saxon Petro. Co., Ltd.	300, 600	P G		X	0.40	—
Briarwood[1]	ZGD	140	J. Constantine & Son	300, 600	P G		X	0.40	—
Brier[1]	GDVJ	—	Laird Line, Ltd.	300, 600	P G		X	0.10[20]	1.00[20]
Brighton BNF[1]	BNF	130	R. Chapman & Son	300, 600	P G		X	0.40	—
Brighton MOV[3]	MOV	95	L.B. & S.C.R. Co.	300, 600	P G		N	0.15[19]	1.50[19]
Bristol City[1]	GDML	—	C. Hill & Sons	300, 600	P G		X	0.40	—
Britannia GFNP[1]	GFNP	—	P. & A. Campbell, Ltd.	300, 450, 600	P G		X	0.10[20]	1.00[20]
Britannia GCRB[3]	GCRB	140	Eastern Telegraph Co.	300, 450, 600	P		X	0.40	—
British Admiral[1]	ZYY	170	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Baron[1]	EYU	200	Petroleum S.S. Co., Ltd.	300, 600	P G		X	0.40	—
British Beacon[1]	BOU	155	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Birch[1]	EYD	—	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Coast[1]	GDTC	150	Coast Lines, Ltd.	300, 600	P G		X	0.10[20]	1.00[20]
British Colonel[1]	GFDB	—	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Duke[1]	EYY	170	Petroleum S.S. Co., Ltd.	300, 600	P G		X	0.40	—
British Earl[1]	EYS	140	Petroleum S.S. Co., Ltd.	300, 600	P G		X	0.40	—
British Emperor[1]	ZLK	175	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Empress[1]	ZYZ	160	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Ensign[1]	ZYV	150	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Fern[1]	EZE	—	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Holly[1]	EZJ	—	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Isles[1]	ZYW	150	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Knight[1]	EYN	130	Petroleum S.S. Co., Ltd.	300, 600	P G		X	0.40	—
British Lantern[1]	BON	140	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Light[1]	BOD	120	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Major[1]	BLN	160	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—
British Maple[1]	EYB	—	British Tanker Co., Ltd.	300, 600	P G		X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
British Marquis [1]	EYW	150	Petroleum S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
British Marshall [1]	YJJ	—	British Tanker Co., Ltd.	300, **600**	P G	X	0.40	—	
British Peer [1]	EYM	150	Petroleum S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
British Princess [1]	ZYT	180	British Tanker Co., Ltd.	300, **600**	P G	X	0.40	—	
British Rose [1]	EQC	190	British Tanker Co., Ltd.	300, **600**	P G	X	0.40	—	
British Sailor [1]	OFK	—	British Tanker Co., Ltd.	300, **600**	P G	X	0.40	—	
British Soldier [1]	YQR	140	British Tanker Co., Ltd.	300, **600**	P G	X	0.40	—	
British Sovereign [1]	ZYU	150	British Tanker Co., Ltd.	300, **600**	P G	X	0.40	—	
British Star [1]	BOI	150	British Tanker Co., Ltd.	300, **600**	P G	X	0.40	—	
British Tommy [1]	GFQL	—	British Tanker Co. Ltd.	300, 450, **600**	P G	X	0.40	—	
British Transport [1]	ZDT	115	Empire Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
British Vine [1]	EPK	—	British Tanker Co., Ltd.	300, **600**	P G	X	0.40	—	
British Viscount [1]	GFDY	—	British Tanker Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Briton [1]	MQJ	250	Union-Castle Mail S.S. Co., Ltd	300, **600**	P G	N	0.40	—	
Broadmayne [1]	EXX	140	Associated Oil Carriers, Ltd.	300, **600**	P G	X	0.40	—	
Brocktown [1]	GCXJ	—	Brock S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Brodsworth [1]	ESE	140	R. S. Dalgliesh, Ltd.	300, **600**	P G	X	0.40	—	
Bronte GCPZ [1]	GCPZ	—	Lamport & Holt, Ltd.	300, **600**	P G	X	0.40	—	
Brookvale [1]	BRB	—	Rhonda Shipping & Coal Exporting Co.	300, **600**	P G	X	0.40	—	
Browning [1]	GCBL	—	Lamport & Holt, Ltd.	300, **600**	P G	X	0.40	—	
Bruges [8]	GDWJ	—	G.E. Railway Co...	300, 450, **600**	P G	N	0.10[30]	1.00[30]	
Bruyere [1]	GCBM	165	Lamport & Holt, Ltd.	300, **600**	P G	X	0.40	—	
Brynmead [1]	EVH	—	Western Counties Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Bryntawe [1]	BSR	140	H. & E. Goldberg..	300, **600**	P G	X	0.40	—	
Brynymor [20]	GFYV	100	Tor Maritime Proprietary, Ltd.	300, **600**	P G	X	0.40	—	
Buccinum [1]	GCQP	—	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Buchanness [1]	ZIO	—	Cornborough Shipping Line, Ltd.	300, **600**	P G	X	0.40	—	
Buckleigh [1]	BDY	160	Medit. Cargo Steamers, Ltd.	300, **600**	P G	X	0.40	—	
Bulimba [1]	NGG	170	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Buranda [1]	LSY	145	Buranda S.S. Co.	300, **600**	P G	X	0.40	—	
Burdale [1]	XFM	120	Burdale S.S. Co.	300, **600**	P G	X	0.40	—	
Burgondier [1]	OEZ	—	Lloyd Royal Belge (Gt. Brit.), Ltd.	300, **600**	P G	X	0.40	—	
Burgundy [1]	BDM	170	D. MacIver, Sons & Co., Ltd.	300, **600**	P G	X	0.40	—	
Burma [8]	GVT	140	Burma S.S. Co., Ltd.	300, 450, **600**	P G	1000 to 1200 1400 to 1600 2000 to 2400	0.40	—	
Burmese Prince [1]	GRP	250	Prince Line, Ltd...	300, **600**	P G	N	0.40		

Burnholme[1]	ELV	—	Rowland & Marwoods S.S. Co. ..	300, 600	P G	..	X	0.40	—
Burnhope[1]	GXQ	—	Burnett S.S. Co., Ltd. ..	300, 600	P G	..	X	0.15[21]	1.50[8]
Burutu[3]	YVC	—	British & African S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Bury[1]	ODK	—	Great Central Railway	300, 600	P G	..	X	0.40	—
Buteshire[8]	GVH	100	Scottish Shire Line, Ltd. ..	300, 450, 600	P G	..	X	0.40	—
Butetown[1]	BBH	—	Town Line	300, 600	P G	..	X	0.40	—
Byron[1]	GDH	250	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, 600	P G	..	N	0.40	—
Cabotia[1]	YFH	180	Anchor Donaldson Line	300, 600	P G	..	X	0.40	—
Cadillac[1]	EYF	160	Anglo-American Oil Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Caesarea[1 16]	MSZ	250	L. & S.W. R. Co.	300, 600	P G	..	N	0.15[18]	1.50[18]
Cahiracon[1]	XJF	—	Limerick S.S. Co., Ltd.	300, 450, 600	P G	..	X	0.40	—
Cairndhu[1]	YVO	180	Cairns, Noble & Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Cairngowan[1]	EWZ	170	Cairn Line of Steamships, Ltd. ..	300, 600	P G	..	X	0.40	—
Cairnmona[1]	ZFC	155	Cairn Line of Steamships, Ltd. ..	300, 600	P G	..	X	0.40	—
Cairnvalona[1]	XJK	155	Cairn Line of Steamships, Ltd. ..	300, 600	P G	..	X	0.40	—
Caithness[1]	YCX		Sutherland S.S. Co.	300, 600	P G	..	X	0.40	—
Calabria MAJ[1]	MAJ	200	Henderson Bros.	300, 600	P G	..	N	0.40	—
Calchas[1]	GDPT	—	Ocean S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Calcutta GCZR[1] ..	GCZR	—	Anglo-American Oil Co.	300, 600	P G	..	X	0.40	—
Calderon[1]	GBWZ	110	MacAndrews & Co.	300, 600	P G	..	X	0.40	—
Caledonia[1]	MNU	230	P. & O. S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Caledonian[1]	MDT	150	F. Leyland & Co., Ltd.	300, 600	P G	..	N	0.40	—
Calgary[1]	GFJT	—	British & African S.N. Co., Ltd. ..	300, 450, 600	P G	..	X	0.40	—
Calypso GBFM[1] ..	GBFM	—	Ellerman's Wilson Line, Ltd. ..	300, 600	P G	..	X	0.15[21]	1.50[21]
Camberley ZCS[1] ..	ZCS	—	Romney S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Cambria[3] GDRV ..	GDRV	—	L. & N.W. Railway Co.	300, 600	P G	..	N	0.10[20]	1.00[20]
Cambria GFNQ[1] ..	GFNQ	—	P. & A. Campbell, Ltd.	300, 450, 600	P G	..	X	0.10[20]	1.00[20]
Cambria MCG[3] ..	MCG	170	Eastern Telegraph Co.	300, 450, 600	P	..	X	0.40	—
Cambrian MNT[1] ..	MNT	180	F. Leyland & Co., Ltd.	300, 600	P G	..	X	0.40	—
Camerata[1]	ETT	135	La Tunisienne S.N. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Cameronia[3]	GDXS	300	Anchor Line, Ltd.	300, 450, 600	P G	..	N	0.40	—
Cameronian[1]	GLI	200	F. Leyland & Co., Ltd.	300, 600	—		—	—	—
Camillo[1]	YNF	160	"Camillo" Tank S.S. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Camito[1]	YSK	230	Elders & Fyffes, Ltd.	300, 600	P G	..	X	0.40	—
Camoens[1]	ZBB	170	Liverpool, Brazil and River Plate S.N. Co., Ltd.	2100[26], 2200[26] 300, 600	P G	..	X	0.40	—
Canada MCF[1] ..	MCF	260	British & North Atlantic S.N. Co., Ltd.	300, 600	P G	..	N	0.40	—
Canadian Transport[1]	ZDU	130	Empire Transport Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Canadier[1]	BCP	160	Lloyd Royal Belge, Ltd.	300, 600	P G	..	X	0.40	—
Canara[1]	GAF	170	British India S.N. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Canastota[1]	YSO	300	Canastota S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Candidate[1]	EYK	—	Charente Steamship Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Cano[1]	GDFC	—	MacAndrews & Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Canonesa[1]	GCKM	—	Furness, Houlder Argentine Lines	300, 600	P G	..	X	0.40	—
Canning[1]	GKG	210	Oceanic S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Canopic[1]	MPC	170	Oceanic S.N. Co., Ltd.	300, 600	P G	..	N	0.40	—
Capac[1]	GXI	180	Job Bros.	300, 600	P G	..	X	0.40	—
Cape Breton[1] ..	EQE	190	Lyle Shipping Co., Ltd.	300, 600	P G	..	X	0.40	—
Cape Colony[1] ..	EYV	—	British Africa S.S. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Cape Corso[1] ..	EWD	170	Sir Wm. Garthwaite	300, 600	P G	..	X	0.40	—
Capel Hall[1] ..	ZLF	—	H. W. Renny	300, 600	P G	..	X	—	—
Cape Natal[1] ..	XJW	150	British Africa S. & C. Co., Ltd. ..	300, 600	P G	..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Cape of Good Hope [1]	XMP	—	British Africa S. & C. Co., Ltd.	300, **600**	P G	X	0.40	—	
Cap Finisterre [1]	GBZL	—	Orient S.N. Co., Ltd.	300, **600**	—	—	—	—	
Cape Ortegal [1]	ZTY	—	Lyle Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Cape Premier [1]	XXO	—	British Africa S. & C. Co., Ltd.	300, **600**	P G	X	0.40	—	
Cape Transport [1]	ZDS	140	Empire Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
Cap Polonio [1]	GBMD	—	P. & O. S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Caprella [1]	OFH	160	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Capsa [1]	LUE	150	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Cap Verde [1]	GBTC	—	P. & O. S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Caraquet [1]	MQD	170	Royal Mail Steam Packet Co.	300, **600**	P G	N	0.40	—	
Cardiff EXW [1]	EXW	135	R. W. J. Sutherland & Co.	300, **600**	P G	X	0.40	—	
Cardiff Hall [1]	ZUZ	135	Hansen Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Cardigan [1]	BCQ	170	Cardigan S.S. Co.	300, **600**	P G	X	0.40	—	
Cardiganshire [1]	MAU	200	Royal Mail Steam Packet Co.	300, **600**	P G	N	0.40	—	
Cardium [1]	MZB	200	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Carisbrook [1]	EKF	—	Red Cap S.S. Co. Ltd.	300, **600**	P G	X	0.40	—	
Carisbrook Castle [1]	MOW	200	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Carlo [1]	GBVM	—	Ellerman's Wilson Line, Ltd.	300, **600**	P G	X	0.40	—	
Carlo Victoria	ZTZ	—	James McKelvie & Co.	300, **600**	P G	X	0.40	—	
Carlow Castle [1]	YDB	165	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Carmania [25]	MAA	350	Cunard S.S. Co., Ltd.	300, 450, **600** 2200[26]	P G	N	0.40	—	
Carmarthenshire [1]	MUS	220	Royal Mail Steam Packet Co.	300, **600**	P G	N	0.40	—	
Carmia [1]	GFDQ	—	Donaldson Line, Ltd.	300, 450, **600**	P G	X	0.40	—	
Carnarvonshire [1]	MZR	220	Royal Mail Steam Packet Co.	300, **600**	P G	N	0.40	—	
Carolus [1]	GDBL	125	Ohlson S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Caronia [8]	MRA	350	Cunard S.S. Co., Ltd.	300, 450, **600** 2100,[26] 2200[26]	P G	N	0.40	—	
Carpentaria [1]	MHG	190	British India Steam N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Carperby [1]	BTS	120	Sir R. Ropner & Co., Ltd.	300, **600**	P G	X	0.40	—	
Carrigan Head [1]	ZKT	150	Ulster S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Carron [1]	LSP	—	Carron Co.	300, **600**	—	X	—	—	
Carston [1]	GXY	150	Bathampton S. N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Carventum [1]	GIX	—	Rome S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	

Cassandra[1]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cassia[1]	MPO	160	Anglo-Saxon Petro. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Castalia MWZ[1] ..	MWZ	180	Anchor Line, Ltd.	300, **600**	P G ..	X	0.40	—
Castillano[1]	XKZ	150	Gulf Line, Ltd.	—	—	—	—	—
Castillian	GBVX	—	—	300, **600**	P G ..	X	0.40	—
Castlemead[1]	YIE	145	**Western Counties Shipping Co., Ltd.**	300, **600**	P G ..	X	0.40	—
Catalina ZHL[1] ..	ZHL	210	**Royal Mail Steam Packet Co.** ..	300, **600**	P G ..	X	0.40	—
Caterino[1]	ZFI	170	Gulf Line, Ltd.	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Cauca[1]	GVZ	140	Pacific S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Cavallo[1]	GDNS	—	Ellerman's Wilson Line, Ltd. ..	300, **600**	P G ..	X	0.40	—
Cavour[1]	YOR	200	Liverpool, Brazil and River Plate S. N. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Cawdor Castle ..	GCRF	170	Union-Castle Mail S.S. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Cedar Branch[1] ..	YMP	170	Nautilus S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Codarmore[1]	GDSY	—	Johnston Line, Ltd.	300, **600**	P G ..	X	0.40	—
Cedric[1]	MDC	250	Oceanic S.N. Co., Ltd.	300, **600** 2100[36], 2200[36]	P G ..	N	0.40	—
Celtic MLC[1]	MLC	250	Oceanic S.N. Co., Ltd.	300, **600** 2100[36], 2200[36]	P G ..	N	0.40	—
Celtic Prince[1]	XIX	120	**Prince Line, Ltd.**	300. **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Celticstar[1]	ZXQ	120	Union Cold Storage Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Cento[1]	GVR	145	Corinthian S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Centurion EYL[1] ..	EYL	—	Charente Steamship Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Ceramic[1]	MCP	250	Oceanic S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Cervantes[1]	GBXC	140	MacAndrews & Co., Ltd.	300, **600**	P G ..	X	0.40	—
Chakdara[1]	MUO	180	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Chakdina[1]	MZY	180	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Chakla[1]	MWQ	180	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Chakrata[1]	GPE	170	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Chaleur[1]	GMN	220	Royal Mail Steam Packet Co. ..	300, **600**	P G ..	N	0.40	—
Chalister[1]	ESF	170	Anglo-Newfoundland Div. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Chama[1]	ZLZ	190	African S.S. Co., Ltd.	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Chancellor[1]	ZLA	—	Charente Steamship Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Chanda[1]	GPT	180	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Changuinloa[1]	MPM	200	Elders & Fyffes, Ltd.	300, **600**	P G ..	X	0.40	—
Chantala[1]	GDNC	—	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Chatham ZSH[1] ..	ZSH	—	Britain S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Chaudiere[1]	GDK	180	Royal Mail Steam Packet Co. ..	300, **600**	P G ..	N	0.40	—
Chemnitz[1]	GBCJ	—	G. Thompson & Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Chenab[2]	GWK	115	James Nourse, Ltd.	300, **600**	P G ..	X	0.40	—
Cheniston[1]	OCH	140	Brantingham S.S. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Chepstow Castle[1] ..	ZAN	150	Union-Castle Mail S.S. Co., Ltd. ..	300, **600**	P G ..	N	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type)	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*contd*							Francs.	Francs	
Cherry Branch[1]	YYZ	160	F. & W. Ritson	300, **600**	P G	X	0.40	—	
Cherryleaf[1]	ZZN	220	Lane & Macandrew, Ltd.	300, **600**	P G	X	0.40	—	
Chertsey[1]	YDM	200	Britain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Cheyenne GCRK[1]	GCRK	145	Anglo-American Oil Co.	300, **600**	P G	X	0.40	—	
Chicago City[1]	BQX	150	C. Hills & Sons	300, **600**	P G	X	0.40	—	
Chignecto[1]	MBV	220	Royal Mail Steam Packet Co.	300, **600**	P G	N	0.40	—	
Chile GCRL[1]	GCRL	220	Pacific S.N. Co., Ltd.	300, **600**	P G	N	0.40	—	
Chilier[1]	BUQ	—	Lloyd Royal Belge (Great Britain), Ltd.	300, **600**	P G	X	0.40	—	
Chilka[1]	GDNJ	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
China MMU[1]	MMU	250	P. & O. S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Chindwara[1]	GAR	170	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Chindwin[1]	GWG	180	Burmah S.S. Co., Ltd.	300, **600**	P G	1000 to 1200 1600 to 1800 2000 to 2400	0.40	—	
Chinese Prince[1]	YJD	—	Prince Line, Ltd.	300, **600**	P G	X	0.40	—	
Chingford[1]	YGJ	115	Fernlands S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Chinkoa[1]	MKO	170	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Chipana[1]	ZJE	—	New York & Pacific S.S. Co., Ltd.	300, **600**	P G	X	—	—	
Chirripo[1]	GDCT	—	Elders & Fyffes, Ltd.	300, **600**	P G	X	0.40	—	
Chiswick[1]	BNX	140	Britain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Chow Tai[1]	GDXY	—	General S.N. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Chupra[1]	GPU	170	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Chyebassa[1]	MYF	180	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Cilondia[1]	GBXK	—	City of London Shipping and Trading Co., Ltd.	300, **600**	P G	X	0.40	—	
Cilurnum[1]	GCZM	135	Hall Bros. S.S. Co.	300, **600**	P G	X	0.40	—	
Cimbrier[1]	EON	140	Lloyd Royal Belge (Gt. Britain), Ltd.	300, **600**	P G	X	0.40	—	
Circassia[1]	MWY	190	Henderson Bros. (Anchor Line)	300, **600**	P G	X	0.40	—	
Circe Shell[1]	ZDC	185	Anglo Saxon Petro. Co., Ltd	300, **600**	P G	X	0.40	—	
Ciscar[1]	GCKB	—	MacAndrews & Co., Ltd.	—	—	—	—	—	
City[1]	BCD	150	Bede S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
City of Adelaide[1]	GDPX	200	Hall Line, Ltd.	300, **600**	P G	X	0.40	—	
City of Agra[1]	MNZ	175	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
City of Alexandria[1]	GBDQ	—	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
City of Algiers[1]	MDU	—	Transport & Trading Co	300, **600**	P G	X	0.40		

City of Auckland[1] ..	GBDK	—	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Baroda[1] ..	EOE	170	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Batavia[1] ..	GBRP	—	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Belfast[8] ..	BBJ	220	Midland Railway Co.	300, 400, 600[24]	P G	..	X	0.40	—
City of Benares[1] ..	GCPJ	250	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Birmingham[1]	BDS	135	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Bombay[1] ..	GUJ	160	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Bradford[2] ..	BCZT	—	Great Central Rly.	300, 600	P G	..	X	0.40	—
City of Brisbane[1] ..	GDNX	—	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Bristol[1] ..	GCPF	150	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Cairo[1]	YYV	200	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Calcutta[1] ..	GCPK	200	Ellerman Lines, Ltd.	300, 600	P G	..	N	0.40	—
City of Cambridge[1] ..	GFCL	—	City Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Canton[1] ..	YSM	180	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Chester[1] ..	MAG	150	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Christiania[1] ..	GFMV	—	Ellerman Lines, Ltd.	300, 450, 600	P G	..	X	0.40	—
City of Colombo[1] ..	GYG	160	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Corinth[1] ..	XEX	135	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Delhi[1] ..	GIC	150	Ellerman Lines, Ltd.	300, 600	P G	..	N	0.40	—
City of Dunedin[1] ..	GBTN	—	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Dunkirk[1] ..	GDD	180	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Durban[1] ..	GDSN	—	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Durham[1] ..	GCPW	160	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Edinburgh[1] ..	GNC	100	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Exeter[1] ..	MSW	230	Ellerman Lines, Ltd.	300, 600, 2100[26], 2200[26]	P G	..	X	0.40	—
City of Florence[1] ..	YYQ	145	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Genoa[1] ..	GBFT	—	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Glasgow[1] ..	GDRS	—	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Hankow[1] ..	MUG	180	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Harvard[1] ..	GBFK	—	Ellerman & Bucknall S.S. Co., Ltd.	300, 450, 600	P G	..	X	0.40	—
City of Karachi[1] ..	GBW	200	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Lahore[1] ..	GCPS	200	Ellerman Lines, Ltd.	300, 600	P G	..	N	0.40	—
City of Leeds[1] ..	GCZS	—	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Lincoln[1] ..	GDP	150	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of London GBLV[28]	GBLV	100	Aberdeen Steam Navigation Co., Ltd.	300, 600	P G	..	X	0.10[20]	1.00[20]
City of London GCPX[1]	GCPX	140	Ellerman Lines, Ltd.	300, 600, 2100[26], 2200[26]	P G	..	X	0.40	—
City of Madras[1] ..	MCY	160	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Madrid[1] ..	MTM	160	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Manchester[1] ..	ZGG	170	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Manila[1] ..	ZHF	170	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Marseilles[1] ..	GCPY	250	Ellerman Lines, Ltd.	300, 600	P G	..	N	0.40	—
City of Melbourne[1] ..	GBPR	170	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Milan[1] ..	GBND	—	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Naples[1] ..	GCPT	150	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Newcastle[1] ..	YYU	180	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Norwich[1] ..	GYA	170	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Oran[1]	YTB	170	City of Oran S.S. Co.	300, 600	P G	..	X	0.40	—
City of Oxford ..	GBYR	—	Ellerman & Bucknall S.S. Co. ..	300, 600	P G	..	X	0.40	—
City of Palermo[1] ..	GBDW	—	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—
City of Paris[1]	GFOM	—	City Line, Ltd.	300, 450, 600	P G	..	X	0.40	—
City of Pekin[1] ..	GDSJ	200	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
City of Poona[1] ..	GBB	230	Ellerman Lines, Ltd.	300, 600	P G	..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs	
UNITED KINGDOM—*contd.*									
City of Rangoon [1]	MTP	160	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
City of Reims [1]	XEP	—	Olivier & Co., Ltd.	300, **600**	P G	X	0.40	—	
City of Shanghai [1]	EMM	180	Hall Line, Ltd.	300, **600**	P G	X	0.40	—	
City of Simla [1]	GFQN	—	Ellerman Lines, Ltd.	300, 450, **600**	P G	X	0.40	—	
City of Smyrna [1]	EII	155	Franco-British S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
City of Sparta [1]	YUK	180	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
City of Sydney GCSD [1]	GCSD	—	Hall Line, Ltd.	300, **600**	P G	X	0.40	—	
City of Tokio [1]	GFMW	—	Ellerman Lines, Ltd.	300, 450, **600**	P G	X	0.40	—	
City of Valencia [1]	GBDP	—	Ellerman & Bucknall S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
City of Versailles [1]	YNO	—	Franco-British S.S. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
City of Winchester [1]	LUC	135	Ellerman Lines, Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
City of Windsor [1]	BRE	—	Transport & Trading Co., Ltd.	300, **600**	P G	X	0.40	—	
City of York [1]	GAO	250	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
Clam [1]	YHZ	130	Anglo Saxon Petro. Co., Ltd.	300, **600**	P G	X	0.40	—	
Clan Alpine [1]	XJE	140	Cayzer, Irvine & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Buchanan [1]	YVZ	145	Cayzer, Irvine & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Chattan [1]	ZHS	135	Cayzer, Irvine & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Chisholm [1]	LSF	125	Cayzer, Irvine & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Colquhoun [1]	YZA	145	Cayzer, Irvine & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	

Clan Cumming[1] ..	YOH	150	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	0900 to 1200 1400 to 1800 2000 to 2200			
Clan Kennedy[1] ..	EQI	150	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G .	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Kenneth[1] ..	YES	—	Cayzer, Irvine & Co., Ltd. .	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Lamont[1] ..	YON	200	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Lindsay[1] ..	YOO	120	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macaulay[1] ..	YJQ	125	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macbean	XJD	120	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macbeth[1] .	YVV	200	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macbrayne[1] ..	YPS	160	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macbride[1] ..	ZHT	150	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macdonald[1] ..	ZHV	145	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macfadyen[1] ..	LSG	130	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macgillivray[1] ..	GVS	100	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macindoe[1] ..	GDXN	175	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Clan Macinnes[1] ..	GCTP	—	Cayzer, Irvine & Co., Ltd. ..	300, 600	P G ..	—	—	—	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Clan Macintosh [1] ..	ZGE	150	Cayzer, Irvine & Co., Ltd. ..	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macintyre [1] ..	MOC	—	Cayzer, Irvine & Co., Ltd. ..	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Maciver [1]	GFPY	—	Cayzer, Irvine & Co., Ltd. ..	300, 450, **600**	P G ..	X	0.40	—	
Clan MacKay	YTI	—	Cayzer, Irvine & Co., Ltd. ..	300, **600**	P G ..	—	0.40	—	
Clan MacKellar [2] ..	GZM	100	Cayzer, Irvine & Co., Ltd. ..	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Mackenzie [1] ..	YXX	180	Cayzer, Irvine & Co., Ltd. ..	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Mackinlay [1] ..	YXC	135	Cayzer, Irvine & Co., Ltd. ..	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Mackinnon [1] ..	YOG	145	Cayzer, Irvine & Co., Ltd.	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Maclaren [1] ..	YJO	—	Cayzer, Irvine & Co., Ltd. ..	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macmaster [1] ..	ZXK	130	Cayzer, Irvine & Co., Ltd. ..	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macmillan [1] ..	XKV	140	Cayzer, Irvine & Co., Ltd. ..	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Macnab [1]	GBYD	200	Cayzer Irvine & Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	

Clan Macnair[1] ..	..	GFNK	—	Cayzer, Irvine & Co., Ltd.	..	300, 450, 600	P G	..	X	0.40	
Clan Macphee[1]	..	ZCB	170	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan Macquarrie[2]	..	GVL	100	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan MacTaggart[1]	..	GDPV	—	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	X	0.40	—
Clan MacTavish[1]	..	GDPW	—	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	X	0.40	—
Clan Macvicar[1]	..	XHB	120	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan Macwilliam[1]	..	LTS	100	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan Malcolm[1] ..	..	ZQK	140	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan Matheson[1]	..	MZQ	150	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan Menzies[1]	..	LSH	—	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan Monroe[1]	.	EIS	140	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan Morrison[1]	.	EIR	200	Cayzer, Irvine & Co., Ltd.	.	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan Murdoch[1]	.	ZSA	160	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan Murray[1] ..	..	LSR	110	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan Ogilvy[3] ..	..	GVV	100	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Clan Ranald[1] ..	..	EIT	140	Cayzer, Irvine & Co., Ltd.	..	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Clan Robertson[1]	ZHU	150	Cayzer, Irvine & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Ross[3]	GVU	100	Cayzer, Irvine & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Sinclair[1]	YZB	150	Cayzer, Irvine & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Stuart[1]	ZPN	145	Cayzer, Irvine & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Sutherland[1]	YJP	120	Cayzer, Irvine & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clan Urquhart[1]	YZG	190	Cayzer, Irvine & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Clara Zelck[1]	GDFL	—	Coast Lines, Ltd.	300, **600**	P G	X	0.40	—	
Clare Hugo Stinnes I[1]	GBCZ	—	Bell, Symondson & Co.	300, **600**	P G	X	0.40	—	
Clarissa Radcliffe[1]	EWF	190	Clarissa Radcliffe S.S. Co.	300, **600**	P G	X	0.40	—	
Claro[1]	ODV	120	Ellerman's Wilson Line, Ltd.	300, **600**	P G	X	0.40	—	
Classic[1]	ZCF	—	Belfast S.S. Co. Ltd.	300, **600**	P G	X	0.05[10]	0.50[10]	
Claus Horn[1]	GCTK	—	Harris & Dixon, Ltd.	300, **600**	P G	X	0.40	—	
Claymont[1]	BAH	—	Scarisbrick S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Claymore GFPR[1]	GFPR	—	David MacBrayne, Ltd.	300, 450, **600**	P G	X	0.10[10]	1.00[10]	
Clayton[3]	GCTF	200	Scarisbrick S. S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Clearpool[1]	LTI	130	Pool Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Clearton[1]	YGI	125	R. Chapman & Son	300, **600**	P G	X	0.40	—	
Clearway[1]	MYH	210	Anglo-Oriental Nav. Co., Ltd.	300, **600**	P G	X	0.40	—	
Clematis EOB	EOB	—	Leeston Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Clemenceau[1]	ZRH	120	London Transport Co.	300, **600**	P G	X	0.40	—	

Cleopatra III [1]	GDPQ	—	Ocean Salvage Co., Ltd.	300, 600	P G	X	0.40	—
Cliftower [1]	YMA	145	Hansen Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Cliftonhall [1]	EKV	110	Dimsdalehall S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Clintonia [1]	YHT	145	Stag Line, Ltd.	300, 600	P G	X	0.40	—
Cloutsham [1]	ZIS	—	Tatem S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Clumberhall [1]	GXW	110	W. Hartlepool S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Cluny Castle [1]	GCRN	200	Union-Castle Mail S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Clutha [1]	YVD	—	W. Roberts	300, 600	P G	X	0.40	—
Clydemede [1]	BOP	—	Canute S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Clydesdale [1]	BDF	180	Wearmouth S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Clyne Rock [1]	GDKL	100	Pridmore & Roe	300, 600	P G	X	0.40	—
Coatsworth [1]	GCDB	175	Robert Stanley Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Coblenz [1]	GFCP	—	Leith Hull and Hamburg S.P. Co., Ltd.	300, 600	P G	X	0.15 [21]	1.50 [21]
Coconada [1]	GCRP	210	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Colaba [1]	GBT	175	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Colleen Bawn [3]	YWM	110	Lan. & Yorks. Rly. Co.	300, 600	P G	N	0.10 [20]	1.00 [20]
Collegian [1]	MTL	—	Charente Steamship Co., Ltd.	300, 600	P G	X	0.40	—
Collingham [1]	EJZ	—	Pentwyn S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Colon GCKD [1]	GCKD	120	MacAndrews & Co., Ltd.	300, 600	P G	X	—	—
Colonia BBS [1]	BBS	—	Shipping Controller	300, 600	P G	X	0.40	—
Colonia MCL [8]	MCL	250	Telegraph Construction & Maintenance Co., Ltd.	300, 600	P	—	—	—
Colonial [1]	YSY	170	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Columbia MOI [1]	MOI	230	Henderson Bros. (Anchor Line)	300, 600	P G	N	0.40	—
Comanchee [1]	GCRQ	140	Anglo-American Oil Co., Ltd.	300, 600	P G	X	0.40	—
Comedian [1]	ZWD	—	Charente Steamship Co., Ltd.	300, 600	P G	X	0.40	—
Comeric [1]	GBTD	160	Bank Line, Ltd.	300, 600	P G	X	0.40	—
Comic [1]	LSK	110	Belfast S.S. Co., Ltd.	300, 600	P G	X	0.05 [20]	0.50 [20]
Comino [1]	BTD	—	Gulf Line, Ltd.	300, 600	P G	X	0.40	—
Commodore [1]	BCG	—	Charente Steamship Co., Ltd.	300, 600	P G	X	0.40	—
Commonwealth GCRS [1]	GCRS	170	P. & O. S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Competitor [1]	YQJ	135	Leeston Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Comrie Castle [1]	GCRT	200	Union-Castle Mail S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Concordia [1]	ELI	190	Donaldson Line, Ltd.	300, 600	P G	X	0.40	—
Confield [1]	XEU	120	Confield S.S. Co., Ltd	300, 600	P G	X	0.40	—
Conia [1]	OFM	150	Anglo-Saxon Petroleum Co., Ltd.	300, 600	P G	X	0.40	—
Constantin [8]	GDXF	150	Mr. Gumuchdjian	300, 600	P G	X	0.40	—
Conway [1]	ZHM	180	Royal Mail S.P. Co., Ltd.	300, 600	P G	X	0.40	—
Cooee GDLF [9]	GDLF	200	Commonwealth Government Line	300, 450, 600	P G	X	0.40	—
Cooeyanna [1]	GBV	170	British India S.N. Co. Ltd.	300, 600	P G	X	0.40	—
Copenhagen EXS [1]	EXS	140	Glasgow Shipowners Co.	300, 600	P G	X	0.40	—
Coq EYO (Le) (*see* Le Coq)								
Coquetmede [1]	BDE	—	D. & T. G. Adams	300, 600	P G	X	0.40	—
Corbank [1]	BAA	110	Cory Colliers, Ltd.	300, 600	P G	X	0.10 [20]	1.00 [20]
Corbrae [1]	MYT	130	Cory Colliers, Ltd.	300, 600	P G	X	0.10 [20]	1.00 [20]
Corby [1]	BDD	145	Corinthian S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Corcliff [1]	ZDY	—	Cory Colliers, Ltd.	300, 600	P G	X	0.10 [20]	1.00 [20]
Corcovado MIE [1]	MIE	210	Pacific S.N. Co.	300, 600	P G	0900 to 1100 2000 to 0200	0.40	—
Corcove [1]	ZEC	115	Cory Colliers, Ltd.	300, 600	P G	X	0.10 [20]	1.00 [20]
Corcrag [1]	ZAT	—	Cory Colliers, Ltd.	300, 600	P G	X	0.10 [20]	1.00 [20]
Corcrest [1]	BBV	130	Cory Colliers, Ltd.	300, 600	P G	X	0.05	0.50
Cordale [1]	GDFW	—	Cory Colliers, Ltd.	300, 600	P G	X	0.10 [20]	1.00 [20]

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*con'd.*							Francs.	Francs.	
Cordelia MXM	MXM	170	Oil Tank S.S. Co., Ltd.	300, **600**	P M	X	0.40	—	
Cordillera [1]	GDRK	—	Donaldson South American Line, Ltd.	300, **600**	P G	X	0.40	—	
Cordoba GBCR [1]	GBCR	—	Orient S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Corfe Castle [1]	ERE	—	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Corfell [1]	ZBZ	145	Cory Colliers, Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
Corglen [1]	BKM	120	Cory Colliers, Ltd.	300, **600**	P G	X	0.10[20]	1.00[21]	
Corinthic [1]	MWT	230	Ocean S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Corland [1]	GFCT	120	Cory Colliers, Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
Corloch [1]	YTS	135	Cory Colliers, Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
Cormorant MFJ [2]	MFJ	140	Western Telegraph Co.	300, **600**	P	—	—	—	
Cormorant BTZ [1]	BTZ	110	Cork S.S. Co., Ltd.	300, **600**	P G	X	0.05[20]	0.50[20]	
Cormount [1]	XXT	—	Cory Colliers, Ltd.	300, **600**	P G	X	0.40	—	
Cornish City [1]	YHR	150	St. Just S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Cornishman [1]	GDW	230	British & N. Atlantic S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Cornish Point [1]	ZPE	180	Norfolk and North American S.S. Co.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Cornwall [1]	GDQM	—	Federal S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Cornwood [1]	GFCJ	—	Wm. France Fenwick & Co., Ltd.	300, **600**	P G	X	0.15[21]	1.50[21]	
Coronado GBC [1]	GBC	190	Elders & Fyffes, Ltd.	300, **600**, 2100[38], 2200[38]	P G	X	0.40	—	
Coronaldo [1]	GFDJ	—	Donaldson S. American Line, Ltd.	300, **600**	P G	X	0.40	—	
Corpath [1]	GDJR	—	Cory Colliers, Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
Corrientes GDMP [1]	GDMP	—	Donaldson S. American Line, Ltd.	300, **600**	P G	X	0.40	—	
Corsican **MCN** [2]	MCN	240	Allen Line S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Corstar [1]	EXT	100	Cory Colliers, Ltd.	300, **600**	P G	X	0.05[20]	0.50[20]	
Corstream	GCXW	—	Cory Colliers, Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
Cortes [1]	GBXD	—	MacAndrews & Co., Ltd.	300, **600**	P G	X	0.40	—	
Corton [1]	BMO	145	Cory Colliers, Ltd.	300, **600**	P G	X	0.05[20]	0.50[20]	
Cortona [1]	GFDP	—	Donaldson S. American Line, Ltd.	300, 450, **600**	P G	X	0.40	—	
Corwen [1]	EVI	140	Cory Colliers, Ltd.	300, **600**	P G	X	0.05[20]	0.50[20]	
Cosmos [1]	LTD	—	Severn Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Cosmos Volga [1]	ZRU	150	O. & W. Williams & Co.	300, **600**	P G	X	0.40	—	
Counsellor [1]	BCH	—	Charente Steamship Co., Ltd.	300, **600**	P G	X	0.40	—	
County of Cardigan [1]	ETP	150	County Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
County of Carmarthen [1]	YVN	100	County Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Courtfield [1]	YCH	200	Century Shipping Co., Ltd.	300, **600**	P G	N	0.40	—	

Courtown[1]	LUS	115	Anglo-Saxon Petro. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Cowrie[1]	ZMW	175	New York & Pacific S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Cova[1]	GXH	180	Coylet S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Coylet[1]	BNO	—	Charente Steamship Co., Ltd. ..	300, 600	P G ..	X	—	—
Craftsman MHV[1] ..	MHV	—						
Cramond[1]	GBNQ	170	W. Thomson & Co.	300, 600	P G ..	X	0.40	—
Crane YDP[3]	YDP	—	General S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Cranfield[1]	GRQS	—	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Cranford GDST[1] ..	GDST	—	Brentford Gas Co.	300, 600	P G ..	X	0.10[20]	1.00[20]
Cranley[1]	YSP	175	Anglo-Newfoundland Dev. Co., Ltd.	300, 600	P G ..	X	0.40	—
Cranmore[1]	EVK	170	Johnston Line, Ltd.	300, 600	P G ..	X	0.40	—
Crawford Castle[1] ..	BGO	—	Union Castle Mail S.S. Co., Ltd...	300, 600	P G ..	X	0.40	—
Crenatula[1]	OFG	120	Anglo-Saxon Petroleum Co., Ltd.	300, 600	P G ..	X	0.40	—
Crenella[1]	YPK	170	Velefa S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Cretic[1]	MRC	170	Oceanic S.N. Co., Ltd.	300, 600	P G ..	N	0.40	—
Crewe Hall[1]	EIJ	150	Hall Line, Ltd.	300, 600	P G ..	X	0.40	—
Cromer[2]	ZOB	—	Great Eastern Railway Co. ..	300, 600	P G ..	N	0.10[20]	1.00[20]
Cromerton[1]	GDQF	—	Anglo-Commercial Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Cronstadt[1]	BUE	145	W. Thomson & Co.	300, 600	P G ..	X	0.40	—
Crosby Hall[1]	EIK	125	Hall Lines, Ltd.	300, 600	P G ..	X	0.40	—
Crosshill[1]	BEU	180	Macbeth & Co., Ltd.	300, 600	P G ..	X	0.40	—
Crostafels[1]	GBDX	—	Harris & Dixon, Ltd.	300, 600	P G ..	X	0.40	—
Croxteth Hall[1] ..	GBTF	—	Hall Line, Ltd.	300, 600	P G ..	X	0.40	—
Cufic[1]	GDR	180	Oceanic S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Culna[1]	GOQ	190	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Cundall[1]	OEB	120	Furness, Withy & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Curaca[1]	YKA	200	New York & Pacific S.S. Co., Ltd.	300, 600	P G ..	N	0.40	—
Curraghmore[3]	GCLR	150	L. & N.W. Railway	300, 600	P G ..	N	0.40	—
Custodian GCE[1] ..	GCE	220	Charente S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Cutcombe[1]	ZLS	—	Maritime Shipping & Trading Co.	300, 600	P G ..	X	0.40	—
Cuthbert[1]	YPR	155	Booth S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Cutty Sark[8]	GDJQ	125	Major Henry Keswick	300, 450, 600	P G ..	X	—	—
Cyclops GTF[7]	GTF	90	Ocean S.S. Co., Ltd.	300, 450, 600	P G ..	X	0.40	4.00
Cymric Pride	BJQ	145	Anglo-Belgique Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Cymric Vale[1]	LUG	145	Anglo-Belgique Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Cypria	ZZL	180	Cunard S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Cyprian Prince[1] ..	GCMT	170	Prince Line..	300, 600	P G ..	X	0.40	—
Cyrena[1]	ZAW	—	Anglo-Saxon Petro. Co., Ltd. ..	—	—	—	—	—
Dacre Castle[1]	MTO	150	Lancashire Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Dacre Hill[1]	GDNK	—	Southwich Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
D.A.D.G. 76[1]	GDKZ	—	Glen Line, Ltd.	300, 600	P G ..	X	0.40	—
Dagenham[1]	GCDQ	110	J. Hudson & Co., Ltd.	300, 600	P G ..	X	0.05[20]	0.50[20]
Daghestan[1]	YLL	145	Rome S.S. Co.	300, 600	P G ..	X	0.40	—
Dago[1]	ODW	—	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.15[19]	1.50[19]
Dakahlieh[1]	GFJP	—	Khedivial Mail S.S. and Graving Dock Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Dakarian[1]	GFCY	—	Frederick Leyland & Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Dakotian[1]	GFNB	—	Frederick Leyland & Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Dalemead[1]	YIF	—	Western Counties Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Dalewood[1]	GFQR	—	Wm. France Fenwick & Co., Ltd.	300, 450, **600**	P G ..	X	0.40	—	
Dallington[1]	ODE	115	Southdown S.S. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Dalworth[1]	GDCM	—	Dalgliesh Steam Shipping Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Danafi Head[1]	YAQ	150	Ulster S.S. Co., Ltd.	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Dania, GBTK[1] ..	GBTK	—	A. Holt & Co.	300, **600**	P G ..	X	0.40	—	
Danier[1]	GCNZ	—	Lloyd Royal Belge (Gt. Britain), Ltd.	300, **600**	P G ..	X	0.40	—	
Darnholme[1]	YLD	150	Gordon S.S. Co., Ltd.	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Darro[1,22]	GCRV	260	Royal Mail Steam Packet Co ..	300, **600**, 2100[26], 2200[26]	P G ..	N	0.40	—	
Datchet[1]	EWH	140	Britain S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
David Lloyd George[1]	EOS	200	Williams & Mordey	300, **600**	P G ..	X	0.40	—	
Daybeam	GCYP	—	Claymore Shipping Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Daybreak	GCYQ	—	Claymore Shipping Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Deerwood[1]	XIK	120	W. France, Fenwick & Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Defender YTE[1] ..	YTE	230	Charente S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Delambre[1]	BHC	190	Lamport & Holt	300, **600**	P G ..	X	0.40	—	
Delaware GCRW[1] ..	GCRW	200	Anglo-American Oil Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Delphinula[1]	MXR	170	Anglo-Saxon Petro. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Delta GBJT[1]	GBJT	145	J. & A. Roxburgh	300, **600**	P G ..	X	0.40	—	
Delta MKG[1]	MKG	240	P. & O. S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Demerara[1,22]	GCRZ	250	Royal Mail Steam Packet Co. ..	300, **600**, 2100[26], 2200[26]	P G ..	N	0.40	—	
Demodocus[1]	ZKH	180	A. Holt & Co.	300, **600**	P G ..	X	0.40	—	
Demosthenes[1] ..	MGK	230	China Mutual S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Denis[1]	MDE	170	Booth S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Derbyshire[20]	MYB	300	Bibby S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Derindje[1]	GBKC	—	Hall Bros.	300, **600**	P G ..	X	0.40	—	
Derwent River[1] ..	ZEF	170	British Empire S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Deseado[1]	GCRX	250	Royal Mail Steam Packet Co. ..	300, **600**	P G ..	N	0.40	—	
Deena[1]	GCRY	250	Royal Mail Steam Packet Co. ..	[illegible]	P G ..	[illegible]	[illegible]	—	
Dessau[1]	GBMR	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	
Destro[1]	[illegible]	—	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

[illegible]	[illegible]	210	[illegible]	[illegible]	P G	X	0.40	—
[illegible]	[illegible]	180	[illegible]	300, 600	P G	X	0.40	—
[illegible]	ZBJ	180	Federal S.N. Co., Ltd.	300, 600	P G	0800 to 1200 1400 to 1500 1800 to 2400	0.40	—
Devonia [1]	GFNM	—	P. & A. Campbell, Ltd.	300, 450, 600	P G	X	0.10[20]	1.00[20]
Devon City [1]	ESD	150	St. Just S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Dewsbury [3]	BEQ	—	Great Central Railway	300, 600	P G	X	—	—
Diadem [1]	GDRX	—	Hall Bros. Steamship Co., Ltd.	300, 600	P G	X	0.40	—
Dibble Bridge [1]	ZHJ	155	Swift S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Dictator [1]	BDH	170	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Dido GDTM [1]	GDTM	150	Ellerman's Wilson Line, Ltd.	300, 600	P G	Z	0.40	—
Dieppe [3]	MRL	90	L.B. & S.C. Railway Co.	300, 600	P G	N	0.15[10]	1.50[10]
Digby [1]	MNG	190	Furness, Withy & Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Dilwara [1]	GCF	200	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Director ETB [1]	ETB	180	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Discoverer [1]	EJF	170	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Disona [1]	GFKY	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, 600	P G	X	0.40	—
Diyatalawa [1]	ESZ	—	Grahams & Co.	300, 600	P G	X	0.40	—
Djerissa [3]	GZC	100	H. E. Moss & Co., Ltd.	300, 600	P G	X	0.40	—
Dockleaf [1]	EZK	190	Anglo-Saxon Petro. Co., Ltd.	300, 600	P G	X	0.40	—
Dogra [1]	BPB	—	Asiatic S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Dolaura	GCTJ	100	Arthur Meeker (Seattle)	300, 600	P	X	0.40	—
Dolphin Shell [1]	ZEP	200	Anglo-Saxon Petro. Co., Ltd.	300, 600	P G	X	0.40	—
Domala [1]	GDMV	—	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Domingo de Larrinaga [1]	ZJC	170	Domingo de Larrinaga S.S. Co.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Dominic [1]	ZKQ	180	Booth S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Dominion [1]	MDP	260	British & North Atlantic S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Domira [1]	YJR	140	Preston S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Donax [1]	ZNL	185	Anglo-Saxon Petro. Co., Ltd.	300, 600	P G	X	0.40	—
Dongola [1]	MNH	240	P. & O. S.N. Co., Ltd.	300, 600	P G	N	0.40	—
Doonholm [1]	ZXM	130	Mitre Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Dora GBWJ [1]	GBWJ	—	C. Doresa & Co.	300, 600	P G	X	0.40	—
Doricstar [3]	GCVQ	250	Blue Star Line (1920), Ltd.	300, 450, 600	P G	X	0.40	—
Dorie [1]	LSX	150	Dorie S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Dorington Court [1]	MWR	170	Cressington S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Dorset [3]	GRY	320	Potter, Trinder & Gwyn	300, 450, 600	P G	0900 to 1230 1300 to 1400 1600 to 1800 2000 to 2200	0.40	—
Dorsetshire [3]	GDKB	100	Bibby S.S. Co.	300, 450, 600	P G	N	0.40	—
Dotterel [1]	ZRC	—	Cork S.S. Co., Ltd.	300, 600	P G	X	0.05[20]	0.50[20]
Douglas GFBX [1]	GFBX	100	Isle of Man S.P. Co., Ltd.	300, 600	P G	N	0.10[20]	1.00[20]
Douro ODJ [1]	ODJ	135	Ellerman's Wilson Line, Ltd.	300, 600	P G	X	0.40	—
Drachenfels [1]	YUR	—	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Draco [1]	GFQB	—	Ellerman's Wilson Line, Ltd.	300, 450, 600	P G	X	0.40	—
Dramatist [1]	GDVY	—	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Dromore [1]	GDSF	180	Johnston Line	300, **600**	P G ..	X	0.40	—	
Dromore Castle [1] ..	YAD	—	Union Castle Mail S.S. Co., Ltd...	300, **600**	P G ..	X	0.40	—	
Dront [1]	YDL	—	Ornis S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Drujba [1]	GDSQ	—	C. Doresa & Co.	300, **600**	P G ..	X	0.40	—	
Dryden ZHW [1] ..	ZHW	—	Stag Line, Ltd.	300, **600**	P G ..	X	0.40	—	
Duchess of Devonshire [2]	GPP	150	Midland Railway Co.	300, 400, **600**	P G ..	N	0.40	—	
Duendes [1]	GCSB	250	Pacific S.N. Co., Ltd.	300, **600**	P G ..	0900 to 1100, 2000 to 0200	0.40	—	
Duffield [1]	ZQJ	150	Northern Petroleum Tank S.S. Co.	300, **600**	P G ..	X	0.40	—	
Duke of Argyll [2] ..	YWK	110	Lan. & Yorks & L.&N.W. Railway Cos.	300, **600**	P G ..	N	0.10[20]	1.00[20]	
Duke of Clarence [2] .	YWL	130	Lancs. & Yorks. Railway Co. ..	300, **600**	P G ..	N	0.10[20]	1.00[20]	
Duke of Connaught [2] ..	YWI	110	Lan. & Yorks. & L.&N.W. Railway Cos.	300, **600**	P G ..	N	0.10[20]	1.00[20]	
Duke of Cornwall [1] ..	XFG	120	Duke of Cornwall S.S. Co., Ltd...	300, **600**	P G ..	X	0.40	—	
Duke of Cumberland [2]	YWJ	110	Lan. & Yorks. & L.&N.W. Railway Cos.	300, **600**	P G ..	N	0.10[20]	1.00[20]	
Dumana [1]	GDNF	—	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Dumfries [1]	BFA	150	Sutherland S.S. Co., Ltd... ..	300, **600**	P G ..	X	0.40	—	
Dumra [1]	XGC	160	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Dunara Castle [1] ..	GFNV	—	Martin Orme & Co.	300, 450, **600**	P G ..	X	0.10[20]	1.00[20]	
Dunbridge [1]	OCG	180	Canadian Pacific Ocean Services, Ltd.	300, **600**	P G ..	X	0.40	—	
Duncluthа [1]	EZA	—	Scottish Nav. Co.	300, **600**	P G ..	X	0.40	—	
Dundrennan [1]	EJI	—	Scottish Nav. Co.	300, **600**	P G ..	X	0.40	—	
Dundrum Castle [1] ..	YAX	—	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G ..	X	—	—	
Dunera [1]	GCU	230	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Duneric [1]	EXG	125	Calypso Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Dungeness ELQ [1] ..	ELQ	150	Litricheux Line, Ltd.	300, **600**	P G ..	X	0.40	—	
Dunluce Castle [1] ..	MQO	250	Union-Castle Mail S.S. Co., Ltd...	300, **600**	P G ..	N	0.40	—	
Dunmail [1]	GBSZ	170	Sharp S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Dunolly [1]	BNW	115	Scottish Nav. Co.	300, **600**	P G ..	X	0.40	—	
Dunstan [1]	ZLE	170	Booth S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Dunvegan Castle [1] ..	MPQ	270	Union-Castle Mail S.S. Co., Ltd...	300, **600**	P G ..	N	0.40	—	
Duquessa [1]	ZQC	120	Furness Houlder Argentine Lines, Ltd.	300, **600**	P G ..	0600 to 0800, 0900 to 1200, 1400 to 1800, 2000 to 2302	0.40	—	

Durham GQC[*] ..	GQC	300	Federal S.N. Co., Ltd. ..	300, 600	P G ..	[illegible] to [illegible] 1300 to 1400 1600 to 1800 2000 to 0100		
Durham Castle[1] ..	MQN	220	Union-Castle Mail S.S. Co., Ltd...	300, 600	P G ..	N	0.40	—
Earlswood[1]	YDD	125	Aster Shipping Co., Ltd.	300, 600	P G ..	X	—	—
Easterly[1]	GCKN	—	Fratres, Ltd.	—	—	—	—	—
Eastcliffe[1]	YXB	—	John Priestman	300, 600	P G ..	X	0.40	—
Eastern[3]	YUH	250	Eastern & Australian S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Eastern City[1]	YGZ	145	St. Just S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Eastern Prince[1] ..	GBDZ	—	Prince Line, Ltd.	300, 600	P G ..	X	0.40	—
Eastgate[1]	HFH	135	Turnbull, Scott Shipping Co. ..	300, 600	P G ..	X	0.40	—
Eastminster Abbey[1] ..	GBFD	—	David S.S. Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Eastney[1]	GFJB	—	Romney S.S. Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Eastwood[1]	ZWN	160	Macbeth Co., Ltd.	300, 600	P G ..	X	0.40	—
Eaton Hall[1]	EZY	120	Hansen Shipping Co.	300, 600	P G ..	X	0.40	—
Ebani[1]	ZCG	180	British & African S.N. Co. ..	300, 600	P G ..	X	0.40	—
Eboe[1]	ZTE	200	African S.S. Co.	300, 600	P G ..	X	0.40	—
Ebro[1]	MTI	230	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Eburna[1]	ZMV	165	Anglo-Saxon Petro. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Edavana[1]	GDPJ	—	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Edendale[1]	OFP	120	Weardale S.S. Co., Ltd.	300, 600	P G ..	X	0.15[21]	1.50[21]
Eden Hall[1]	ZRF	110	Westcott & Lawrence Line, Ltd.	300, 600	P G ..	X	0.40	—
Edinburgh Castle[1] ..	MQE	230	Union-Castle Mail S.S. Co., Ltd.	300, 600 2100[26], 2200[26]	P G ..	N	0.40	—
Edith Cavell YCM[1] ..	YCM	180	Sefton S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Edmonton[1]	XHG	—	Canada S.S. Lines, Ltd.	300, 600	P G ..	X	0.40	—
Edmund Hugo Stinnes[1]	GBVR	—	Burdick & Cook	300, 600	P G ..	X	0.40	—
Eduard Woermann[1] ..	GBDR	—	Union-Castle Mail S.S. Co., Ltd...	300, 600	P G ..	X	0.40	—
Egba[1]	GRO	220	African S.S. Co.	300, 600	P G ..	X	0.40	—
Eggesford[1]	YXJ	170	Mediterranean Cargo Steamers, Ltd.	300, 600	P G ..	X	0.40	—
Egori[1]	YVH	170	African S.S. Co.	300, 600	P G ..	X	0.40	—
Egra[1]	GCSF	190	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Egremont Castle[1] ..	YZT	145	Lancashire Shipping Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Egwanga[1]	YMM	170	British & African S.N. Co., Ltd...	300, 600	P G ..	X	0.40	—
Egypt[1]	MMG	250	P. & O. S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Egyptian[1]	GDNY	—	Ellerman Lines, Ltd.	300, 600	P G ..	X	0.40	—
Egyptian Transport[1]	ZDW	140	Empire Transport Co.	300, 600	P G ..	X	0.40	—
Ehrenfels[1]	GBJS	—	J. & A. Roxburgh	300, 600	P G ..	X	—	—
Eider ZSL[1]	ZSL	140	Royal Mail Steam Packet Co. ..	300, 600	P G ..	X	0.40	—
Eileen	GAN	200	S. B. Joel	300, 600	P G ..	X	0.40	—
Eirene[1]	GBLM	—	Eirene S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Ekari[1]	GDMN	—	African S.S. Co.	300, 600	P G ..	X	0.40	—
Ekaterinoslav ZLJ[1] ..	ZLJ	200	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Ekma[1]	GCSJ	190	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Elbing[1]	GBXL	—	W. Runciman & Co.	300, 600	P G ..	X	0.40	—
El Cordobes[1]	MHO	250	British & Argentine S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Elder Branch[1] ..	YFT	170	Nautilus Steamship Co., Ltd ..	300, 600	P G ..	X	0.40	—
Electra[3]	MEE	140	Eastern Telegraph Co., Ltd. ..	300, 450, 600	P ..	X	0.40	—
Electrician[1]	YHO	170	Charente S.S. Co.	300, 600	P G ..	X	0.40	—
Elephanta[1]	GCSK	200	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Ellaline	BKB	—	Mordey, Jones & Co.	300, **600**	P G	X	0.40	—	
Ellenga [1]	GCSL	230	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Ellerdale [1]	YVL	145	Gordon S.S. Co.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	—	—	
El Lobo [1]	YVB	—	C. T. Bowring, Ltd.	300, **600**	P G	X	0.40	—	
Ellora [1]	GCSM	230	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Elmina [1]	MZI	190	African S.S. Co.	300, **600**	P G	X	0.40	—	
Elmleaf [1]	EZF	190	Anglo-Saxon Petro. Co., Ltd.	300, **600**	P G	X	0.40	—	
Elmpark [1]	GDMF	—	Denholm Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
El Paraguayo [1]	GCSP	—	Houlder Bros. & Co., Ltd.	300, **600**	P G	X	0.40	—	
Elpenor [1]	ZKD	250	China Mutual S.N. Co.	300, **600**	P G	X	0.40	—	
Elswick Grange [1]	GBF	155	Elswick S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Elswick Hall [1]	MYD	—	Elswick S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Elswick House [1]	ZHX	135	Elswick S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Elswick Tower [1]	BEF	125	Elswick S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
El Uruguayo [1]	GCSQ	250	British & Argentine S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Elveric [1]	MBX	150	A. Weir & Co.	300, **600**	P G	X	0.40	—	
Elwick [1]	MYJ	150	Sharp S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Elswick Park [1]	GDQV	—	Elswick Steam Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Elysia [1]	MRH	180	Henderson Bros. (Anchor Line)	300, **600**	P G	X	0.40	—	
Elzasier [1]	BQQ	150	Lloyd Royal Belge (Gt. Britain), Ltd.	300, **600**	P G	X	0.40	—	
Emden [1]	GCXT	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Emerald [1]	GBNK	—	Sir A. Du Cros, Bart., M.P.	300, **600**	P G	X	0.40	—	
Emil Georg v Stauss [1]	GFPM	—	British Tanker Co., Ltd.	300, **600**	P G	X	0.40	—	
Emlynian [1]	GCNL	175	Hopkins Jones & Co., Ltd.	300, **600**	P G	X	0.40	—	
Empirestar [1]	GCTB	250	Blue Star Line, Ltd.	300, 450, **600**	P G	X	0.40	—	
Empress [1]	GUI	50	S.E. & C. Railway Co.	300, **600**	P G	N	0.15	—	
Empress of Britain [20]	MPB	300	Canadian Pacific Railway Co.	300, 450, **600**	P G	N	0.40	—	
Empress of France [1]	GYH	250	Allan Line S.S. Co.	300, **600**	P G	N	0.40	—	
Enfield [1]	YKE	100	Enfield S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Engadine [6]	GUK	50	S.E. & C. Railway Co.	300, **600**	P G	N	0.40	—	
Ennisbrook [1]	BKG	190	Brook S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
E. O. Saltmarsh [1]	EPA	130	Pensacola Trading Co.	300, **600**	P G	X	0.40	—	
Epsom [1]	ERH	—	Britain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Eric Calvert [1]	XBK	125	A. Calvert Shipping Co.	300, **600**	P G	X	0.40		
Ericus [1]	GVK	[illegible]	[illegible]	300, **600**	P G	X	0.40		

Erika	GBYF	—	Furness, Withy & Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Erinier [1]	YYX	—	Lloyd Royal Belge (Gt. Britain), Ltd.	300, 600	P G ..	X	0.40	—
Erlesburgh [1]	GCRD	155	Rowland & Marwood S.S. Co. ..	300, 600	P G ..	X	0.40	—
Ernemore [1]	OCJ	150	Johnston Line, Ltd.	300, 600	P G ..	X	0.40	—
Eros BTK [1]	BTK	120	L. Wright & Co.	300, 600	P G ..	X	0.40	—
Erroll [1]	ERZ	—	J. Warrack & Co.	300, 600	P G ..	X	0.40	—
Escalona [1]	GPZ	170	Anglo-Saxon Petro. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Eskasoni XHC [1] ..	XHC	150	New Line S.S. Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Eskbridge [1]	YKG	135	N. of England S.S. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Eskwood [1]	GCTY	—	E. Johnson & Co., Ltd.	—	—	—	—	—
Esperanza de Larrinaga [1]	EMC	170	Miguel de Larrinaga S.S. Co., Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Essequibo [1]	MTK	230	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Essex GXE [2]	GXE	300	Federal S.N. Co., Ltd.	300, 600	P G ..	0900 to 1230 1300 to 1400 1600 to 1800 2000 to 0100	0.40	—
Estrellano [1]	GDPK	135	Ellerman's Lines, Ltd.	300, 600	P G ..	X	0.40	—
Esturia [10]	BRG	120	British Burma Petro. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Ethelaida [1]	ZSI	—	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.40	—
Ethelaric [1]	LUM	170	Harrowing S.S. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Ethelfreda [1]	GVX	—	J. H. Harrowing	300, 600	P G ..	X	0.40	—
Ethelmead [1]	XED	—	Western Counties Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Ethel Radcliffe [1] ..	GDVX	—	Evan Thomas Radcliffe & Co. ..	300, 600	P G ..	X	0.40	—
Ethelstan [1]	YIU	140	Mertha Rhondda S.S. Co. ..	300, 600	P G ..	X	0.40	—
Ethelwolf [1]	LUL	140	Harrowing S.S. Co. Ltd.	300, 600	P G ..	X	0.40	—
Ethelwynne [1]	BOM	145	Harrowing S.S. Co., Ltd... ..	300, 600	P G ..	X	0.40	—
Euclid [1]	ZQG	180	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Eumaeus [3]	GDYW	250	Ocean S.S. Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Euplectela [1]	EVV	—	Anglo-Saxon Petro. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Euripides [1]	MSE	240	G. Thompson & Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Euryades [1]	YRG	190	Ocean S.S. Co., Ltd.	300, 600	P ..	X	0.40	—
Euryalus [1]	GCZ	180	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Eurybates [1]	YRH	180	Ocean S.S. Co., Ltd.	300, 600	P ..	X	0.40	—
Eurydamas [1]	YQU	170	China Mutual S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Eurylocus [1]	YRI	200	China Mutual S.N. Co., Ltd. ..	300, 600	P ..	X	0.40	—
Eurymachus [1]	YQZ	—	Ocean S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Eurymedon [1]	YRA	170	Ocean S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Eurypylus [1]	YRJ	230	China Mutual S.N. Co., Ltd. ..	300, 600	P ..	X	0.40	—
Euterpe [1]	BFG	170	Sundon Shipping Co.	300, 600	P G ..	X	0.40	—
Everest [1]	GDSL	—	Joseph E. Murrell & Son ..	300, 600	P G ..	X	0.40	—
Everilda [1]	ZYC	145	Ella Sayers S.S. Co.	300, 600	P G ..	X	0.40	—
Everton [1]	GFNZ	—	Hull Steam Fishing & Ice Co., Ltd.	300, 600	P G ..	X	0.10[20]	1.00[20]
Evesham [3]	GDQS	—	Hull Steam Fishing & Ice Co., Ltd.	300, 600	P G ..	X	0.05[20]	0.50[20]
Exeter City [1]	BQW	130	C. Hill & Sons	300, 600	P G ..	X	0.40	—
Exmouth [1]	EOO	145	Exmouth S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Exmouth II [3]	GYF	150	Mngrs. of Metrop. Asylum District	300, 600	P ..	X	0.40	—
Explorer MVV [1] ..	MVV	170	Charente S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
F. A. Tamplin [1] ..	ZLX	135	F. A. Tamplin S.S. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Fabian [1]	GBWS	110	Ellerman Lines, Ltd.	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Falernian [1]	EMK	150	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
Fells City [1]	ZNR	130	St. Just. S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Fallsmead [1]	GCLK	—	Western Counties Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Fanad Head [1]	YXF	150	Ulster S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Fantee	YCC	—	Elder, Dempster & Co., Ltd.	300, **600**	P G	X	0.40	—	
Faraday GTP [3]	GTP	250	Siemens Bros. & Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Farnworth [1]	ZXI	190	Dalgliesh S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Fau Sang [1]	GFKX	—	Indo-China Steam Nav. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Felixstowe [3]	BER	—	Great Eastern Railway Co.	300, 450, **600** [23]	P G	X	0.10 [20]	1.00 [20]	
Fenchurch [4]	ENX	250	Mondrich S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Fenella [1]	GFBZ	—	Isle of Man S.P. Co., Ltd.	300, **600**	P G	N	0.10 [20]	1.00 [20]	
Fernandina OEG [1]	OEG	115	Furness, Withy & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Ferngarth [1]	YKR	140	Barr, Crombie & Co.	300, **600**	P G	X	0.40	—	
Fernhill [3]	GDJV	100	Llewellyn Shipping Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Fieldmarshal	ZWQ	—	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Figuig [11]	ZLV	—	Red Croft S.N. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Filey [1]	GDRL	130	Hull S. Fishing and Ice Co., Ltd.	300, **600**	P G	X	0.05 [20]	0.50 [20]	
Finchley [1]	YIX	135	Watts, Watts & Co., Ltd.	300, **600**	P G	X	0.40	—	
Fionasbell [1]	YKO	—	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Firpark [1]	GDNM	—	Denholm Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Fishpool [1]	ZWL	150	Pool S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Flamborough [3]	GDZN	100	Hull Steam Fishing & Ice Co., Ltd.	300, **600**	P	X	0.10 [20]	1.00 [20]	
Flaminian [1]	YLY	150	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
Flamma [4]	OFR	—	Gas Light & Coke Co.	300, **600**	P G	X	0.05 [20]	0.50 [20]	
Flandrier [1]	MSX	125	Lloyd Royal Belge (Gt. Britain), Ltd.	300, **600**	P G	X	0.40	—	

Filxton[1]	ELU	—	R. A. McClelland	300, **600**	P G ..	X	0.40	—
Flowergate[1]	GBRW	—	Turnbull Scott Shipping Co., Ltd.	300, **600**	P G ..	X	0.40	—
Flying Breeze	EPD	—	Alexandra Towing Co., Ltd. ..	300, **600**	—	X	—	—
Ford Castle[3]	GDYC	100	Tanfield S.S. Co., Ltd.	300, **600**	P G ..	X	0.10[20]	1.00[20]
Forst[1]	GBYC	—	G. Dodd & Co.	300, **600**	P G ..	X	0.40	—
Fort Hamilton[1] ..	GCJQ	—	Furness, Withy & Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Fort Victoria[1] ..	GCTN	—	Furness, Withy & Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Fotinia[1]	ZXS	—	National S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Foyle ZUR[1]	ZUR	150	Mercantile S.S. Co., Ltd... ..	300, **600**	P G ..	X	0.40	—
Framlington Court[1] ..	ERV	135	Court Line, Ltd.	300, **600**	P G ..	X	0.40	—
Frances Duncan[1] ..	ZWG	—	Frances Duncan S.S. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Francis[1]	MDG	170	Booth S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Francisco[1]	GCSW	250	Ellerman's Wilson Line, Ltd. ..	300, **600**	P G ..	0800 to 1300 1400 to 1700 1800 to 2200	0.40	—
Frankburn[1]	YDX	—	Scindia Steam Nav. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Frankby[1]	BEA	—	Scindia Steam Nav. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Frankdale[1]	GBPK	135	Scindia Steam Nav. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Frankenfels[1]	BRI	—	Grahams & Co.	300, **600**	P G ..	X	0.40	—
Frankfurt[1]	GBJF	—	Oceanic S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Frankier[1]	YHF	145	Lloyd Royal Belge (Gt. Britain), Ltd.	300, **600**	P G ..	X	0.40	—
Frankinver[1]	BOF	—	Scindia Steam Navigation Co., Ltd.	300, **600**	P G ..	X	0.40	—
Frankmere[12]	ZAD	250	Scindia Steam Navigation Co., Ltd.	300, **600**	—	X	—	—
Frank Parish[1] ..	MUL	120	Buenos Aires G.S. Rly. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Franktor[1]	YGD	120	Scindia Steam Navigation Co., Ltd.	300, **600**	P G ..	X	0.40	—
Frans Dahl.[1]	GDKL	—	Glen & Co.	300, **600**	P G ..	X	0.40	—
Franziska	GBLD	—	Houlder, Middleton & Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Franz Wilke[1]	GBRM	—	W. Runciman & Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Fraser River[1]	ZEG	150	British Empire S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Fred Cleeves[1] ..	GFJC	—	Cleeves Western Valleys Anthracite Collieries, Ltd.	300, 450, **600**	P G ..	X	0.40	—
Freiberg[1]	GCSD	—	British India S.N. Co., Ltd. ..	—	—	—	—	—
Freienfels[1]	ZPJ	—	Grahams & Co.	300, **600**	P G ..	X	0.40	—
Freshwater[1]	ETS	170	Sefton S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Frieda Fahrenheim[1] ..	GDLS	150	West Hartlepool S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Friesland GDKP[1] ..	GDKP	—	Glen Line, Ltd.	300, **600**	P G ..	X	0.40	—
Frinton[8]	BFV	—	Great Eastern Railway Co. ..	300, 450, **600**	P G ..	N	0.10[20]	1.00[20]
Friedrichsruhe[1] ..	GBKM	—	Orient S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Frontenac[1]	XVY	—	—	—	—	—	—	—
Fullerton[8]	BKZ	—	Denaby & Cadeby Main Collieries, Ltd.	300, **600**	P G ..	X	—	—
Fulmar[1]	GBNW	130	Cork S.S. Co., Ltd.	300, **600**	P G ..	X	0.05[20]	0.50[20]
Fultala[1]	GDC	210	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Furst Bulow[1]	GBCX	—	Lawther Latta & Co.	300, **600**	P G ..	X	0.40	—
Gaboon[1]	ZMK	170	British & African S.N. Co., Ltd...	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Gaelic Prince[1] ..	XIW	160	Prince Line, Ltd.	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Gealicstar	ZXO	190	Union Cold Storage Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Gaika[1]	MQU	230	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G ..	N	0.40	—

Ship Stations—*Continued*

Name	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*cont'd.*									
Gairsoppa [1]	GCZB	180	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Galileo [1]	GII	200	Ellerman's Wilson Lines, Ltd.	300, **600**	P G	0800 to 1300 1400 to 1700 1800 to 2200	0.40	—	
Gallic [1]	MVO	150	Oceanic S.N. Co.	300, **600**	P G	X	0.40	—	
Gallipoli [1]	GBFS	—	Rankin Gilmour & Co., Ltd.	300, **600**	P G	X	0.40	—	
Galtee More [1]	GUU	250	L.&N.W. Railway Co.	300, **600**	P G	N	0.05[20]	0.50[20]	
Galtymore [1]	GBNV	180	Johnston Line, Ltd.	300, **600**	P G	X	0.40	—	
Gamaria [1]	GCZF	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gambada [1]	ZNF	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gambhira [1]	GCQY	150	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gambia [1]	ESH	170	British & African S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gambia River [1]	ZEH	150	British Empire S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gandara [1]	GCMR	170	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Ganges [3]	GWJ	115	James Nourse, Ltd.	300, **600**	P G	X	0.40	—	
Garada [1]	GCMS	180	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Garbeta [1]	GCYX	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gardenia [1]	BFO	135	Stag Line, Ltd.	300, **600**	P G	X	0.40	—	
Garmula [1]	GCZJ	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Garryvale [1]	ELH	160	Dawson Bros.	300, **600**	P G	X	0.40	—	
Garth Castle [1]	MQP	250	Union-Castle Mail S.S. Co., Ltd	300, **600**	P G	N	0.40	—	
Gascon [1]	MQV	220	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Gasconier [1]	OEU	120	Lloyd Royal Belge (Gt. Britain), Ltd.	300, **600**	P G	X	0.40	—	
Gaslight [1]	GDSZ	—	Gas Light and Coke Co.	300, **600**	P G	X	0.40	—	
Gazana [1]	GCYZ	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gellington Court [1]	FUN	—	Court Line, Ltd.	300, **600**	P G	X	0.40	—	
Gelerfels [1]	GDKJ	—	Geo. Thompson & Co., Ltd.	300, **600**	P G	X	0.40	—	
General Allenby [1]	ZZB	—	S. R. Sequerra	300, **600**	P G	X	0.40	—	
General Church [1]	BOL	130	Byron S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
General Milne [1]	GDLC	250	Byron S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
General Napier [1]	GBMR	—	Byron S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
General William [1]	XWC	—	—	—	—	—	—	—	
Genesee MIT [1]	MIT	135	Anglo-American Oil Co.	300, **600**	P G	X	0.40	—	
George Ward [1]	GDYJ	400	Commercial Cable Co., Ltd.	300, 450, **600**	P	X	0.40	—	
Gera [1]	GBLN	—	Phillipps, Phillipps & Co., Ltd.	300, **600**	P G	X	0.40	—	
Gerano [1]	GDJK	—	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
Gerent [1]	XFO	145	J. Westoll	300, **600**	P G	X	0.40	—	
Germanicus	GBCV		Sir R. Ropner & Co., Ltd.	300, **600**	P G	X	[illegible]		

Gertrud GBDV[1]	GBDV	—	Gellatly Hankey & Co. ..	300, 600	P G ..	X	—	—
Gharinda[1]	GCDP	—	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Gibel Yedid[1]	BRS	—	M. H. Bland & Co., Ltd... ..	300, 600	P G ..	X	0.40	—
Gileston[1]	XIJ	110	Thomas Radcliffe & Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Gitano[1]..	GFQC	—	Ellerman's Wilson Line, Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Gladiator[1]	YER	160	Charente S.S. Co., Ltd.	300, 600	P G ..	X	—	—
Glamorganshire[1] ..	BHI	150	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Glanbrydan[1]	GFBT	—	Harries Bros. & Co.	300, 600	P G ..	X	0.40	—
Glasgow[1]	EJQ	130	Rankine Line, Ltd.	300, 600	P G ..	X	0.05[20]	0.50[20]
Glassford[1]	GDCF	—	Mann, McNeal & Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Glaucus[2]	GDYZ	250	Ocean S.S. Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Glenade[1]	GBQC	190	Glen Line Ltd. (Macgregor Gow & Co., Ltd.)	300, 600	P G ..	X	0.40	—
Glenaffric[1]	BIC	160	Rio Cape Line, Ltd.	300, 600	P G ..	X	0.40	—
Glenamoy[1]	ZLP	170	Glen Line (Macgregor Gow & Co., Ltd.)	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Glenapp[2]	GDXT	250	Glen Line, Ltd.	300, 450, 600	P G ..	X	0.40	—
Glenariffe[1]	GCLM	—	Glen Line (Macgregor Gow & Co., Ltd.)	300, 600	P G ..	X	0.40	—
Glenavy[1]	ZLB	155	Glen Line (Macgregor Gow & Co., Ltd.)	300, 600	P G ..	X	0.40	—
Glenbridge[1]	GWX	145	Leeston Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Glendevon[1]	YRT	145	Rio Cape Line, Ltd.	300, 600	P G ..	X	—	—
Glendhu[1]	MXJ	160	Rio Cape Line, Ltd.	300, 600	P G ..	X	0.40	—
Glendun[1]	GFPT	—	Antrim Iron Ore Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Glenearn[1]	GBTS	—	R. J. Thomas & Co., Ltd. ..	—	—	—	—	—
Gleneden[1]	ENR	110	Gleneden S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Glenelg[1]	ZIK	170	Rio Cape Line, Ltd.	300, 600	P G ..	X	0.40	—
Glenetive[1]	MEZ	170	Rio Cape Line, Ltd.	300, 600	P G ..	N	0.40	—
Glenfinlas[1]	BFX	140	S.S. Glenfinlas Co., Ltd.	300, 600	P G ..	X	0.40	—
Glengorm Castle[1] ..	MOS	200	Union-Castle Mail S.S. Co., Ltd...	300, 600	P G ..	N	0.40	—
Glen Gower[1]	GFNT	—	P. & A. Campbell, Ltd.	300, 600	P G ..	X	0.10[20]	1.00[20]
Glengyle[1]	ZKW	210	Glen Line (Macgregor Gow & Co., Ltd.)	300, 600	P G ..	N	0.40	—
Glen Head[1]	ODA	150	Ulster S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Gleniffer[1]	MUE	180	Glen Line (Macgregor Gow & Co., Ltd.)	300, 600	P G ..	X	0.40	—
Glenluce[2]	GCWK	250	Glen Line, Ltd.	300, 450, 600	P G ..	X	0.40	—
Glenluss[1]	GBMN	—	Easton Greig & Co.	300, 600	P G ..	X	0.40	—
Glenlyon[1]	ZOX	175	Rio Cape Line, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Glenmorag[1]	YEP	135	S.S. Glenmorag Co., Ltd... ..	300, 600	P G ..	X	0.40	—
Glennevis[1]	ZVC	170	Rio Cape Line, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Glenogle[1]	GDQW	250	Glen Line, Ltd.	300, 600	P G ..	X	0.40	—
Glenomera[1]	GDCN	—	Mauritius Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Glenorchy[1]	YNU	160	Rio Cape Line, Ltd.	300, 600	P G ..	X	0.40	—
Glenpark[1]	XEB	140	Denholm Line, Ltd.	300, 600	P G ..	X	0.40	—
Glensanda[1]	ENV	145	Glen Line (Macgregor Gow & Co., Ltd.)	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Glenshane[1]	XIO	150	Glen Line (Macgregor Gow & Co., Ltd.)	300, **600**	P G	X	0.40	—	
Glenshiel[1]	YZC	170	Rio Cape Line, Ltd.	300, **600**	P G	N	0.40	—	
Glensloy[1]	YDF	135	S.S. Glensloy Co., Ltd.	300, **600**	P G	X	0.40	—	
Glenspean[1]	ZAB	—	Rio Cape Line, Ltd.	300, **600**	P G	X	0.40	—	
Glenspey[1]	ZHP	150	Glen Line (Macgregor Gow & Co., Ltd.)	300, **600**	P G	X	0.40	—	
Glenstrae[1]	EQR	150	Glen Line (Macgregor Gow & Co., Ltd.)	300, **600**	P G	X	0.40	—	
Glentara[2]	GCWQ	250	Glen Line, Ltd.	300, 450, **600**	P G	X	0.40	—	
Glentworth[2]	GDWN	350	Dalgliesh Steam Shipping Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Glen Usk[1]	GFNS	—	P. & A. Campbell, Ltd.	300, 450, **600**	P G	X	0.10[20]	1.00[20]	
Glint[1]	XFP	100	Gas Light & Coke Co., Ltd.	300, **600**	P G	X	0.05[20]	0.50[20]	
Glitra[1]	XFW	145	Chr. Salvesen Co.	300, **600**	P G	X	0.40	—	
Globe[1]	ZEV	145	Rome S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Glofield[1]	YGX	180	Humphries (Cardiff), Ltd.	300, **600**	P G	X	0.40	—	
Gloria de Larrinaga[1]	ELA	—	Miguel de Larrinaga S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Gloucester Castle[1]	MQZ	170	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Gloucestershire[20]	MYG	300	Bibby S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gloxinia[2]	GDWB	125	Stag Line, Ltd.	300, 450, **600**	P G	X	0.40	—	
Glynymel[1]	BLE	—	Harries Bros. & Co.	300, **600**	P G	X	0.40	—	
Goalpara[1]	GCBW	170	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gogra[1]	GCLB	175	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Golconda	GCKP	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gondia[1]	GCMN	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Golconda[1]	GCKP	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Goodwin[1]	GFLX	—	Clyde Shipping Co., Ltd.	300, 450, **600**	P G	X	0.10[20]	1.00[20]	
Goorkha[1]	MQW	230	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Gorala[1]	GCLD	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gord n Castle[1]	ZNN	170	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Gothic[1]	BJV	190	W. H. Cockerline & Co.	300, **600**	P G	X	0.40	—	

Ship	Call	Tons	Owner	Wave lengths	Service	Hours	Rate	Rate
Gothic Prince[1]	XIU	155	Prince Line, Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Gothicstar[1]	YVR	170	Union Cold Storage Co., Ltd.	300, 600	P G	X	0.40	—
Gourko[1]	ODX	120	Ellerman's Wilson Line, Ltd.	300, 600	P G	X	0.40	—
Governor ENE[1]	ENE	140	Charente S.S. Co., Ltd.,	300, 600	P G	X	0.40	—
Gracchus[1]	GDF	180	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Grace Dollar[1]	ZOY	—	Dollar S.S. Line	300, 600	P G	X	0.40	—
Gracefield[1]	OCY	130	Wm. Thomas & Sons, Ltd.	300, 600	P G	X	0.40	—
Gracia[1]	GFDR	—	Donaldson Line, Ltd.	300, 450, 600	P G	X	0.40	—
Graciana[1]	ZFD	160	Furness, Withy & Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Graf Waldersee	GBZM	—	P. & O. S.N. Co., Ltd.	—	—	—	—	—
Graig[1]	ENG	—	Graig Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Grainton[1]	YPN	150	Carlton S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Grampian[1]	MRN	230	Allen Line, Ltd.	300, 600	P G	N	0.40	—
Grangemouth[1]	GBNP	170	Rankine Line, Ltd.	300, 600	P G	X	0.05	0.50
Grangepark[1]	GCNW	—	Denholm S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Grantley[1]	OBC	125	Furness, Withy & Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Grantully Castle[1]	MQQ	210	Union-Castle Mail S.S. Co., Ltd.	300, 600	P G	N	0.40	—
Graphic[1]	LSJ	160	Belfast S.S. Co., Ltd.	300, 600	P G	X	0.05[20]	0.50[20]
Gray[1]	YBL	—	Victoria Whaling Co., Ltd.	300, 600	P R	X	—	—
Graziella ELY[1]	ELY	—	James McKelvie & Co.	300, 600	P G	X	0.40	—
Great City[1]	MKW	200	St. Just S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Great Southern[3]	YZV	110	G.W. Railway Co.	300, 600	P G	N	0.10[20]	1.00[20]
Great Western[3]	YZW	110	G.W. Railway Co.	300, 600	P G	N	0.10[20]	1.00[20]
Grecian Prince[1]	YRN	150	Prince Line, Ltd.	300, 600	P G	X	0.40	—
Greenore[3]	GUS	250	L. & N.W. Railway Co.	300, 600	P G	N	0.05[20]	0.50[20]
Greenwich BFB[1]	BFB	120	Britain S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Gregory YLG[1]	YLG	200	Booth S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Greiffenfels[1]	GBLV	—	F. & W. Ritson	300, 600	P G	X	0.40	—
Grelarlie[1]	YFS	145	Griffiths Lewis S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Grelbank[1]	BQP	150	Griffiths Lewis S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Grelben[1]	YFR	145	Temple S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Grelcaldy[1]	ZUW	140	Dulcia S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Greldon[1]	BQK	150	Dulcia S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Greleden[1]	BCB	150	Dulcia S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Grelfryda[1]	LSV	—	Griffiths Lewis S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Grelgrant[1]	YXZ	145	Dulcia S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Grelhead[1]	ZCX	145	Griffiths Lewis S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Grelisle[1]	OER	150	Dulcia S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Grelrosa[1]	XHL	150	Griffiths Lewis S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Grelstone[1]	EPF	150	Griffiths Lewis S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Grelwen[1]	ZZI	155	Griffiths Lewis S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Greyhound[1]	GFPZ	—	Blackpool Passenger Steamboat Co., Ltd.	300, 450, 600	P G	X	0.10[20]	1.00[20]
Greylight[1]	GDPL	—	Starlight S.S. Co., Ltd.	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—(*contd*).									
Greystoke Castle[1]	ZYM	145	Lancashire Shipping Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Grianaig[3]	MOQ	—	Lord Dunraven	300, **600**	P	X	—	—	
Grindon Hall[1]	YAY	170	Leadenhall S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Grigua[1]	ZPT	145	Ellerman & Bucknall S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Grodno[3]	GBVY	140	Ellerman's Wilson Line, Ltd.	300, **600**	P G	X	0.40	—	
Guatemala[1]	MWM	220	Pacific S.N. Co., Ltd.	300, **600**	P G	N	0.40	—	
Guido[1]	GDNV	—	Ellerman's Wilson Line, Ltd.	300, **600**	P G	X	0.40	—	
Guildford Castle[1]	MPZ	220	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Gujarat[1]	GBO	190	Bank Line, Ltd.	300, **600**	P G	N	0.40	—	
Gulf of Suez[1]	XEF	120	Gulf of Suez S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gundreda[1]	GCXM	130	All Seas Marine & Salvage Co., Ltd.	300, **600**	P G	X	0.40	—	
Gundomar[1]	GBFL	—	Lamport & Holt, Ltd.	300, **600**	P G	X	0.40	—	
Gurna[1]	GCZD	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gwladys[1]	EQK	140	Universal S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Gwmeric[1]	EPZ	180	Bank Line, Ltd.	300, **600**	P G	X	0.40	—	
Gwynmead[1]	BJW	145	Western Counties Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Gyp[1]	BFS	135	Preston S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Hagen[1]	GBYW	—	British India S.N. Co. Ltd.	—	—	—	—	—	
Haigtown[1]	ZDA	—	Town Line (London), Ltd.	300, **600**	P G	X	0.40	—	
Haim Mazza[9]	GFYR	—	M. Mazza	300, **600**	P G	X	0.40	—	
Haleric[1]	YHA	145	A. Weir & Co.	300, **600**	P G	X	0.40	—	
H. M. Pellatt[1]	YJV	125	Canada S.S. Lines, Ltd.	300, **600**	P G	X	0.40	—	
Halesius[1]	YGF	—	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Haliartus[1]	GBQJ	150	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Halizones[1]	GCKX	155	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Hallside[1]	GCMP	170	Charlton S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Halo GCLX[1]	GCLX	130	Gas Light & Coke Co., Ltd.	300, **600**	P G	X	0.05[20]	0.50[20]	
Halocrates[1]	BUK	—	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Hambleton Range[1]	YPJ	190	Neptune S.N. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Hamm[3]	ZXT	—	Federal Steam Navigation Co., Ltd.	300, **600**	P G	X	0.40	—	
Hampstead[1]	BZT	135	Watts, Watts & Co., Ltd.	300, **600**	P G	X	0.40	—	

Hampstead Heath[1] ..	EJE	180	S.N. Co. of Canada, Ltd. ..	300, 600	P G	..	X	0.40	—
Hannah[1]	ZYA	—	Rabtkens S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Hannington Court[1] ..	LUB	150	Court Line, Ltd.	300, 600	P G	..	X	0.40	—
Hannover[1]	GBYX	—	Ellerman's Wilson Line, Ltd. ..	300, 600	P G	..	X	0.40	—
Hans Hemsoth[1] ..	XKU	125	Everett & Newbigin	300, 600	P G	..	X	0.40	—
Hans Wilhelm Hemsoth[1]	GBWV	—	Haldin & Co., Ltd.	300, 600	P G	..	X	0.40	—
Hantonia[1 10]	GIL	170	L. & S.W. Railway Co.	300, 600	P G	..	N	0.15[10]	1.50[10]
Harold Casper[1] ..	XXY	150	Swift S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Hardanger[1]	MOB	125	G. B. Harland & Co.	300, 600	P G	..	X	0.40	—
Hardwicke Grange[1] ..	GFQD	—	Houlder Line, Ltd.	300, 450, 600	P G	..	X	0.40	—
Haresfield[1]	GBQR	160	British India S.N. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Harlem[1]	BGS	145	Harlem S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Harlow[1]	YAR	120	Harrison's, Ltd.	300, 600	P G	..	X	0.40	—
Harlseywood[1]	BUH	140	Constantine & Pickering S.S. Co.	300, 600	P G	..	X	0.40	—
Harmodius[1]	GCBX	150	Brit. & S. America S.N. Co., Ltd.	—	—		—	—	—
Harmonides[1]	GCKW	180	Brit. & S. American S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Harperley[1]	EXC	180	J. & C. Harrison, Ltd.	300, 600	P G	..	X	0.40	—
Hartfield[1]	EVL	145	Woodfield S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Hartington[1]	MJX	145	J. & C. Harrison, Ltd.	300, 600	P G	..	X	0.40	—
Hartlepool[1]	ZWS	160	Pool Shipping Co., Ltd.	300, 600	P G	..	X	0.40	—
Hartmore[1]	YXL	—	Johnston Line, Ltd.	300, 600	P G	..	X	0.40	—
Hartside[1]	ZNJ	130	Charlton S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Harvestehude[1] ..	GBQD	—	R. S. Dalgliesh, Ltd.	300, 600	P G	..	X	0.40	—
Hatarana[1]	YUZ	—	British India S.N. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Hatimura[1]	XJB	150	British India S.N. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Hatkhola[1]	YUY	—	British India S.N. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Hatipara[1]	BHH	150	British India S.N. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Haverford[1]	MJH	250	International Nav. Co., Ltd. ..	300, 600	P G	..	N	0.40	—
Havildar[1]	BMD	180	Asiatic S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Havre[1]	ZEW	135	Anglo-Saxon Petro. Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Haworth[1]	GBRN	—	Dalgliesh S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Hazel Branch	ZGZ	150	Nautilus S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Hazelmoor[1]	YII	145	Moor Line, Ltd.	300, 600	P G	..	X	0.40	—
Hazelpark[1]	GFMX	—	Denholm Line Steamers, Ltd. ..	300, 600	P G	..	X	0.40	—
Hazelside[1]	GCKT	—	Charlton S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Headcliffe[1]	EUE	140	Cliffe S.S. Co., Ltd	300, 600	P G	..	X	0.40	—
Heathmore[1]	MXS	135	Davies & Co.	300, 600	P G	..	X	0.40	—
Heathpark[1]	GFMY	—	Denholm Line Steamers, Ltd. ..	300, 600	P G	..	X	0.40	—
Heathside[1]	GCYW	135	Charlton Steam Shipping Co., Ltd.	300, 600	P G	..	X	0.40	—
Hebe	GBLJ	—	C. T. Bowring & Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Hector ZJS[1]	ZJS	—	Ocean S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
HedwigHeidmann ..	GBXJ	—	A. Crawford & Co.	300, 600	P G	..	X	0.40	—
Helcion[1]	YBS	—	Anglo-Saxon Petroleum Co., Ltd.	300, 600	P G	..	X	0.40	—
Helenus[1]	ZJT	230	Ocean S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Hellenes[1]	EOW	220	Brit. & S. American S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Hellopes[1]	YPX	—	Brit. & S. American S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Helmsdale[1]	YEG	120	Strath S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Helmsloch[1]	ZXB	130	Strath S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Helredale[1]	YHC	150	Turnbull, Scott & Co.	300, 600	P G	..	X	0.40	—
Heluan[1]	GBDN	—	Elder Dempster & Co., Ltd. ..	300, 600	P G	..	X	0.40	—
Henri Deutsch de la Meurthe[1]	GCJP	—	Lux Navigation Co., Ltd... ..	300, 450, 600	P G	..	X	0.40	—
Henry Holmes	XJH	—	West India & Panama Tel. Co. Ld.	300, 600	P G	..	X	0.40	—
Henzada[9]	GWD	180	Burma S.S. Co., Ltd.	300, 600	P G	..	1000 to 1200 1600 to 1800 2000 to 2400	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Herefordshire [20] ..	MYA	300	Bibby S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Herman Sauber [1] ..	GBNY	—	Pelton S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Hermione END [1] ..	END	200	Pelton S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Heroic [1]	GCTX	—	Belfast S.S. Co.	300, **600**	P G ..	X	0.05[20]	0.50[20]	
Heronspool [1]	BFI	145	Pool Shipping Co.	300, **600**	P G ..	X	0.40	—	
Herschel [1]	MUA	180	Lamport & Holt, Ltd.	300, **600**	P G ..	X	0.40	—	
Hersfeld [1]	GBSD	—	F. C. Strick & Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Hesione [1]	GBCQ	—	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Hesleysid [1]	ZXH	150	Charlton S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Hesperia [1]	GDKW	180	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Hesperides GDLR [1] ..	GDLR	—	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
H. H. Asquith [1] ..	GDQT	—	Williams & Mordey	300, **600**	P G ..	X	0.40	—	
Hibernia	GCML	—	L. & N.W. Rly. Co., Ltd. ..	300, **600**	P G ..	N	0.40	—	
Highland Enterprise [1] ..	MDA	170	Nelson Line (L'pool), Ltd. ..	300, **600**	P G ..	X	0.40	—	
Highlander [20]	GBMX	100	Aberdeen, Newcastle & Hull Steam Co., Ltd.	300, **600**	P G ..	X	0.10[20]	1.00[20]	
Highland Glen [1] ..	GIR	200	Nelson S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Highland Heather [1] ..	MEK	230	Nelson Line (L'pool), Ltd. ..	300, **600**	P G ..	X	0.40	—	
Highland Laddie [1] ..	GIU	200	Nelson S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Highland Laird [1] ..	MEP	180	Nelson Line (L'pool), Ltd. ..	300, **600**	P G ..	X	0.40	—	
Highland Loch [1] ..	GIY	220	Nelson S.N. Co, Ltd.	300, **600**	P G ..	X	0.40	—	
Highland Piper [1] ..	GNM	220	Nelson S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Highland Pride [1] ..	GJA	220	Nelson S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Highland Rover [1] ..	GJB	200	Nelson S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Highland Star [1] ..	ZLH	220	Nelson S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Highland Warrior [1] ..	GCWN	125	Nelson S.N. Co., Ltd.	300, 450, **600**	P G ..	X	0.40	—	
Highland Watch [1] ..	MER	230	Nelson Line (L'pool), Ltd. ..	300, **600**	P G ..	X	0.40	—	
Highmead [1]	ZTX	—	Western Counties Shipping Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Hilarius [1]	BCU	150	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Hilda [1]	GBVQ	—	R. Gordon & Co.	300, **600**	P G ..	X	0.40	—	
Hildebrand [1]	MDM	200	Booth S.S. Co., Ltd.	300, **600**, 2100[20], 2200[20]	P G ..	X	0.40	—	
Hilde Hugo Stinnes [1] ..	GBXF	—	J. Cormack & Co.	300, **600**	P G ..	X	0.40	—	
Hillhouse [1]	LTF	145	Seville & U.K. Carrying Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Himalaya [1]	MNY	130	P. & O. S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Hindoo [1]	YPZ	—	Ellerman's Wilson Line, Ltd. ..	300, **600**	P G ..	0900 to 1300 1500 to 1800 [illegible]	0.40	—	

Hindu	VUH	—	—	—	—	—	—	—
Hindustan [2]	ZNO	180	Hindustan S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Historian [1]	MHT	210	Charente S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Hocking [1]	XFA	170	J. Cory & Sons, Ltd.	300, 600	P G ..	X	0.40	—
Hogarth [1]	GDQP	—	Lamport & Holt, Ltd.	300, 600	P G ..	X	0.40	—
Hohenfels [1]	GBWF	—	Thos. Law & Co...	300, 600	P G ..	X	0.40	—
Holbein [1]	MUB	190	Lamport & Holt, Ltd.	300, 600	P G ..	X	0.40	—
Holbrook BPU [1] ..	BPU	200	Canadian Pacific Ocean Services, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Hollinside [1]	ZXU	150	Charlton Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Hollypark [1]	YDJ	160	Denholm Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Holsatia [1]	GCXS	—	Burdick & Cook	300, 600	P G ..	X	0.40	—
Holtby [1]	BOW	140	Sir R. Ropner & Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Holywell [1]	YED	150	Well Line, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Homecliffe [2]	GDKN	125	Cliffe Steamship Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Homefield [1]	YAU	170	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Homer City [1]	GAB	220	St. Just S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Honorius [1]	GJE	170	Brit. & S. American S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Hopelyn [1]	YFJ	120	Hopemount S.S. Co., Ltd. ..	300, 600	P G ..	X	0.15 [21]	1.50 [21]
Horden [1]	EYR	115	Burnett & Co.	300, 600	P G ..	X	0.15 [21]	1.50 [21]
Hornbill [1]	GFDT	—	Hull Steam Fishing & Ice Co., Ltd.	300, 450, 600	P G ..	X	0.10 [20]	1.00 [20]
Hornby Castle [1] ..	ZVM	160	Lancashire Shipping Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Hornchurch [1]	GCDL	125	J. Hudson & Co., Ltd.	300, 600	P G ..	X	0.05	0.50
Hornsee [1]	GBLZ	—	J. Westoll	300, 600	P G ..	X	0.40	—
Horn Shell [1]	XLC	210	Anglo-Saxon Petro. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Hororata [1]	MRF	230	New Zealand Shipping Co., Ltd...	300, 600	P G ..	X	0.40	—
Horseferry [1]	XFO	100	Gas Light & Coke Co., Ltd. ..	300, 600	P G ..	X	0.05 [20]	0.50 [20]
Hortensius [1]	ETG	170	Brit. & S. American S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Hostilius [1]	EOX	190	Brit. & S. American S.N. Co., Ltd.	300, 600	P G ..	X	—	—
Hotham Newton [1] ..	XHI	145	Leonado Carrying Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Hound [1]	GDTQ	150	G. & J. Burns, Ltd.	300, 600	P G ..	X	0.10 [20]	1.00 [20]
Hounslow [1]	YKI	150	British S.S. Co., Ltd.	300, 600	P G ..	X	—	—
Housatonic GCDN [1] ..	GCDN	—	Anglo-American Oil Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Huanchaco [1]	GJF	200	Pacific S.N. Co., Ltd.	300, 600	P G ..	0900 to 1100 2000 to 0200	0.40	—
Hubert [1]	MVI	180	Booth S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Huddersfield [1] ..	YGC	170	W. Hepburn & Co.	300, 600	P G ..	X	0.40	—
Hughli [2]	GBRT	150	James Nourse, Ltd.	300, 450, 600	P G ..	N	0.40	—
Hunnic [1]	BRM	—	Grahams & Co.	—	—	—	—	—
Hunsgate [1]	ZYI	120	W. Robertson	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Hunslet [4]	BSK	170	Union-Castle Mail S.S. Co., Ltd...	300, 600	P G ..	X	0.40	—
Hunstanworth [1] ..	GCDZ	170	Robert Stanley Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Huntress [18]	YVF	—	British India S.N. Co., Ltd. ..	—	—	—	—	—
Huntscape [1]	GXU	—	W. Robertson	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Huntscastle[1]	ZQU	170	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Huntsclyde[1]	BEJ	—	Clyde Shipping Co.	300, **600**	P G	X	0.40	—	
Huntsend[1]	YRZ	—	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Huntsgreen[1]	YRO	150	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Huntshead[1]	YEN	150	Jenkins Bros.	300, **600**	P G	X	0.40	—	
Huntspill[1]	ZTQ	240	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Hurliness[1]	BNL	135	W. R. Smith & Sons	300, **600**	P G	X	0.40	—	
Huronian[1]	YZM	200	F. Leyland & Co., Ltd.	300, **600**	P G	N	0.40	—	
Hurunui[1]	GFCZ	—	Federal S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Hyacinthus[1]	GJG	200	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Hyanthes[1]	EJJ	190	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Hydaspes[1]	GJH	200	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Hymettus[1]	GCPL	170	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Hypatia[1]	GJI	190	Brit. & S. American S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Hyrcania[1]	ZZS	145	Caspian Oil Co., Ltd.	300, **600**	P G	X	0.40	—	
Hyson[1]	ZKI	180	China Mutual S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Ibex[3]	MSC	120	G.W. Railway Co.	300, **600**	P G	N	0.40	—	
Ibicuhy[1]	GFJX	—	Eagle Oil Transport Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Idaho GJJ[1]	GJJ	250	Ellerman's Wilson Line, Ltd.	300, **600**	P G	0900 to 1300 1400 to 1700 1800 to 2200	0.40	—	
Ida Zelck[1]	GCVP	—	Bell Bros. & Co., Ltd.	300, **600**	P G	X	0.40	—	
Iddesleigh[1]	ELF	140	Mediterranean Cargo Steamers Ltd.	300, **600**	P G	X	0.40	—	
Idomeneus[1]	GZY	210	Ocean S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Ikala[1]	ZUT	170	Leyland S.S. Co., Ltd	300, **600**	P G	X	0.40	—	
Ilford[1]	YKL	145	Britain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Ilmenau[1]	GBYN	135	Geo. Heyn & Sons	300, **600**	P G	X	0.40	—	
Imani[1]	ZDO	—	T. & J. Brocklebank, Ltd.	300, 450, **600**	P G	X	0.40	—	
Imber[1]	YFD	160	Cork S.S. Co., Ltd.	300, **600**	P G	X	0.05[20]	0.50[20]	
Imperator[1]	GBZW	—	Cunard Line	300, **600** 2100[20], 2200[20]	P G	X	0.40	—	
Ina Blumenthal[1]	GDFN	—	Mann Macneal & Co., Ltd.	300, **600**	P G	X	0.40	—	
Inca MIF[1]	MIF	190	Pacific S.N. Co., Ltd.	300, **600**	P G	0900 to 1100 2000 to 0200	0.40	—	
Incemore[1]	GDVP	—	Johnston Line, Ltd.	300, **600**	P G	X	0.40	—	
Inchmead[1]	YIJ	—	Western Counties Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	

Indian [1]	MHB	190	F. Leyland & Co., Ltd.	300, 600	P G	X	0.40	—
Indian City [1]	GDPC	—	St. Just S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Indian Transport [1]	ZDR	120	Empire Transport Co., Ltd.	300, 600	P G	X	0.40	—
Indianola [1]	ODF	145	Gulf Transport Co.(Liverpool),Ltd.	300, 600	P G	X	0.40	—
Indore [1]	GMI	210	Elder Dempster & Co., Ltd.	300, 600	P G	X	0.40	—
Ingleby [1]	MXI	140	Sir R. Ropner & Co., Ltd.	300, 600	P G	X	0.40	—
Ingoma [1]	GDV	—	Charente S.S. Co., Ltd.	300, 600	P G	N	0.40	—
Inishboffin	LSN	—	Limerick S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Inkula [1]	ODG	—	Gulf Transport Co.(Liverpool),Ltd.	300, 600	P G	X	0.40	—
Inkum [10]	GDZF	100	J. H. Welsford & Co., Ltd.	300, 600	P G	X	0.40	—
Innerton	YFN	—	R. Chapman & Son	300, 600	P G	X	0.40	—
Inston [1]	GFJM	—	S. Instone & Co., Ltd.	300, 450, 600	P G	X	0.40	—
Intaba [1]	MIP	180	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Intombi [1]	ZLL	180	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Inventor [1]	MVY	180	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Inverarder [1]	GBVW	—	British Mexican Petroleum Co., Ltd.	300, 600	P G	X	0.40	—
Inverawe	ZTD	135	Leith, Hull & Hamburg S.S. Co.	300, 600	P G	X	0.40	—
Inveresk [1]	EOU	110	Alby United Carbide Factories, Ltd.	300, 600	P G	X	0.15 [21]	1.50 [21]
Inveric [1]	FPY	150	S.S. "Inveric" Co., Ltd.	300, 600	P G	X	0.40	—
Inverleith [1]	GDVK	—	British Mexican Petroleum Co., Ltd.	300, 600	P G	X	0.40	—
Inverness [1]	EIU	140	Sutherland S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Invicta [3]	GUL	50	S.E. & Chatham Railway	300, 600	P G	N	0.40	—
Ionic [1]	MWI	230	Oceanic S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Ionicstar [1]	ZXP	180	Union Cold Storage Co., Ltd.	300, 450, 600	P G	X	0.40	—
Iris MNI [8]	MNI	200	Pacific Cable Board	300, 600	P	X	—	—
Irishman [1]	GJK	220	Oceanic S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Irish Monarch [1]	YGR	170	Monarch S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Irismere [1]	OCD	150	T. Law & Co.	300, 600	P G	X	0.40	—
Irmgard [1]	GBJD	—	T. Dunlop & Sons	300, 600	P G	X	0.40	—
Iroquois MEI [1]	MEI	160	Anglo-American Oil Co., Ltd.	300, 600	P G	X	0.40	—
Isis GBMY [1]	GBMY	—	Philipps, Philipps & Co., Ltd.	300, 600	P G	X	0.40	—
Islandia [1]	XJN	190	Laurium Transport Co	300, 600	P G	X	—	—
Ismaila [1]	GCQD	180	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Ismailia [1]	ZYH	140	Khedival Mail S.S. & Graving Dock Co.	300, 600	P G	X	0.40	—
Itajahy [1]	GBCQ	—	Elder Dempster & Co., Ltd.	300, 600	P G	X	0.40	—
Italia MAR [3]	MAR	200	Henderson Bros. (Anchor Line)	300, 600	P G	N	0.40	—
Italian [1]	ZLR	130	Ellerman Lines, Ltd.	300, 600	P G	X	0.40	—
Itauri [1]	GBTX	—	R. S. Dalgliesh, Ltd.	300, 600	P G	X	0.40	—
Itola [1]	GCOI	180	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Ivanboe [1]	XEP	—	Franco-British S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Iver Heath	XWB	—	Bishop Nav. Co., Ltd.	300, 600	P G	X	0.40	—
Ixion [1]	GRZ	170	China Mutual S.S. Co., Ltd.	300, 450, 600	P G	X	0.40	—
Izmir [1]	GBVN	—	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Jabiru	LTB	130	Cork S.S. Co., Ltd.	300, 600	P G	X	0.05 [20]	0.50 [20]
Jacobus [1]	GCWL	—	Sir Eric Ohlson	300, 600	P G	X	0.40	—
Jamaica YSI [1]	YSI	130	Royal Mail Steam Packet Co.	300, 600	P G	X	0.40	—
Janeta [1]	ESR	150	S.S. "Janeta" Co. Ltd.	300, 600	P G	X	0.40	—
Janus [1]	GCSR	220	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Jason GLH [1]	GLH	—	Ocean S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Javary GBRQ [1]	GBRQ	—	G. Dodd & Co.	300, 600	—	X	0.40	—
J. Duncan [1]	ZWJ	—	J. Duncan S.S. Co., Ltd.	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Jebba[1]	YUX	—	Elder Dempster & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Jedmead[1]	YMC	145	Western Counties Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Jekri[1]	BHD	—	British & African S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Jersey City[1]	GDRM	—	St. Just S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Jervaulx Abbey[2]	ZOW	140	Hull & Netherland S.S. Co., Ltd.	300, **600**	P G	X	0.05[20]	0.50[20]	
Jeseric[1]	OCC	—	Bank Line, Ltd.	300, **600**	P G	X	0.40	—	
Jessmore[1]	GFJK	—	Johnstone Line, Ltd.	300, 450, **600**	P G	X	0.40	—	
Jeypore[1]	GDBY	—	P. & O. S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
J. L. Lassen[1]	GCVN	—	W. A. Young & Co.	—	—	—	—	—	
Joffre[1]	BRP	70	Lawson S. Tug Boat Co., Ltd.	300, **600**	P G	X	0.40	—	
John Casewell[1]	GDRZ	—	H. Ford, Esq.	300, **600**	P G	X	0.10[20]	1.00[20]	
John Pender[2]	MEF	200	Eastern Telegraph Co., Ltd.	300, 450, **600**	P	—	0.40	—	
Johnstown[1]	BTW	—	Town Line, Ltd.	300, **600**	P G	X	0.40	—	
Jolly Inez[1]	EPH	—	Entente S.S. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Juliston[1]	LSI	130	Juliston S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Julius Zelck[1]	GDJY	130	Mann MacNeal & Co., Ltd.	300, **600**	P G	X	0.40	—	
Junin[1]	GJL	200	Pacific S.N. Co., Ltd.	300, **600**	P G	0900 to 1100 2000 to 0200	0.40	—	
Jura[1]	BNG	—	Isles S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Justin[1]	YPL	220	Booth S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Kabinga[1]	GCPN	140	Ellerman & Bucknall S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Kaduna[1]	ZMS	170	Imperial Direct Line, Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Kaffir Prince[1]	ZFT	160	Prince Line, Ltd.	300, **600**	P G	N	0.40	—	
Kabira (El)	BRE	—	Khedival Mail S.S. & Graving Dock Co., Ltd.	300, **600**	P G	X	0.40	—	
Kaikoura[1]	MRS	230	New Zealand S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Kaimanawa[1]	GBVT	120	Union S.S. Co., of N.Z., Ltd.	300, **600**	P G	X	0.40	—	
Kaiping[1]	YBB	145	Chinese Engineering & Mining Co., Ltd.	300, **600**	P G	X	0.40	—	
Kaisar-i-Hind[1]	MSI	230	P. & O.S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	

Kaiserin Auguste Victoria[1]	GCTM	—	Cunard Line, Ltd.	300, 600, 2100[20], 2200[20]	P G ..	—	0.40	—
Kalwarra[1]	GCDY	—	Union S.S. Co. of New Zealand, Ltd.	300, 600	P G ..	X	0.40	—
Kalimba[1]	BSQ	150	Glasgow Nav. Co., Ltd.	300, 600	P G ..	X	0.40	—
Kalomo[1]	GBY	160	Ellerman & Bucknall S.S. Company, Ltd.	300, 600	P G ..	X	0.40	—
Kalyan[1]	YZO	200	P. & O. S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Kamarima[1]	GNA	170	Canada S.S. Lines, Ltd.. ..	300, 600	P G ..	X	0.40	—
Kamenets Podolsk YBT[1]	YBT	—	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Kamouraska[1]	BEP	190	Laurentian S.S. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Kanawha MNL[1] ..	MNL	250	Furness, Withy & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Kandahar[1]	MAB	190	Ellerman & Bucknall S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Kandy[1]..	BLB	—	Joseph Chadwick & Sons ..	300, 600	P G ..	X	0.40	—
Kansas MRW[1] ..	MRW	150	Ellerman & Bucknall S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Kapurthala[1]	GCDT	—	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Kara[1]	GCNF	140	Strick Line, Ltd.	300, 600	P G ..	X	0.40	—
Karagola[1]	ZNX	260	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Karamea[1]	MSB	180	Shaw, Savill & Albion Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Karapara[1]	YST	240	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Karmala[1]	MTF	220	P. & O. S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Karnak[1]	YKV	190	Moss S.S. Co.	300, 600	P G ..	X	0.40	—
Karoa[1]	BDB	230	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Karroo[1]	GNS	160	Ellerman & Bucknall S.S.Company, Ltd.	300, 600	P G ..	X	0.40	—
Kasama[1]	GBP	145	Ellerman & Bucknall S.S. Company, Ltd.	300, 600	P G ..	X	0.40	—
Kasara[1]	BLD	160	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Kashgar[1]	YYL	210	P. & O. S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Kashmir[1]	YZN	210	P. & O. S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Kassala[1]	ZYD	—	Merlin Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Kastalia[1]	GCLJ	190	Donaldson Line	300, 600	P G ..	X	0.40	—
Katanga[1]	BOZ	160	Chr. Salvesen & Co.	300, 600	P G ..	X	0.40	—
Katharine Park[8] ..	GRU	140	Park & S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Kathiawar[1]	GCPR	170	Bank Line, Ltd.	300, 600	P G ..	N	0.40	—
Kathlamba[3]	GLF	170	Ellerman & Bucknall S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Katie[1]	ZRV	145	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.15[19]	1.50[19]
Katuna[1]	GCPM	150	Ellerman & Bucknall S.S. Co., Ltd	300, 600	P G ..	X	0.40	—
Kazembe[1]	GYQ	145	Ellerman & Bucknall S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Keats[1]	GFQK	—	Shakespear Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Keelung[1]	GCLT	140	Ellerman & Bucknall S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Keemun[1]	ZKP	210	China Mutual S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Kelsomead[1]	YMD	—	Western Counties Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Kelvinbrae[1]	MFY	170	Glasgow S.S. Co., Ltd.	300, 600	P G ..	N	0.40	—
Kenbane Head ..	GBRL	180	G. Heyn & Sons	300, 600	P G ..	X	0.40	—
Kendal Castle[1] ..	GDLZ	300	Lancashire Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Keneh[1]	BTX	150	Khedival Mail S.S. & Graving Dock Co., Ltd.	300, 600	P G ..	X	0.40	—
Kenilworth[1]	XJG	155	Dalgliesh S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Kenilworth Castle[1] ..	MQF	200	Union Castle Mail S.S. Co., Ltd.	300, 600	P G ..	N	0.40	—
				2100[20], 2200[20]	P G ..	N	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Kenmare GFCX[1] ..	GFCX	—	Coast Lines, Ltd...	300, **600**	P G ..	X	0.10[20]	1.00[20]	
Kenmare MXG[1] ..	MXG	—	Merlin Shipping Co.. Ltd. ..	300, **600**	P G ..	X	0.40	—	
Kennebec[1]	GBXP	—	Anglo-American Oil Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Kent[1]	ENI	155	Federal S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Kentucky GDN[1] ..	GDN	150	Ellerman & Bucknall S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Kenuta[1]	GJO	200	Pacific S.N. Co., Ltd.	300, **600**	P G ..	0900 to 1100 2000 to 0200	0.40	—	
Kerkyra[1]	GBWT	—	C. Doresa & Co.	300, **600**	P G ..	X	0.40	—	
Kerman[1]	ZLQ	180	British Tanker Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Keyingham[1]	BMQ	180	Wood Pulp Transport Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Keynes[1]	XFQ	—	Stephenson, Clarke & Co., Ltd. ..	300, **600**	P G ..	X	0.05[20]	0.50[20]	
Khartum[1]	YLK	—	Kaye, Son & Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Khiva[1]	MGZ	220	P. & O. S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Khyber[1]	MCE	230	P. & O. S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Kia Ora[1]	GIP	180	Shaw, Savill & Albion Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Kidderpore[1]	GDBX	—	P. & O. S.N. Co...	300, **600**	P G ..	X	0.40	—	
Kildonan Castle[1] ..	MQK	280	Union-Castle Mail S.S. Co., Ltd...	300, **600**	P G ..	N	0.40	—	
Kincardine[1]	GDSK	—	Grindon Steamship Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Kinfauns Castle[1] ..	MQL	220	Union-Castle Mail S.S. Co., Ltd...	300, **600**	P G ..	N	0.40	—	
King Alexander[1] ..	GBZX	—	Byron S.S. Co., Ltd.	300, **600**	P G ..	N	0.40	—	
King Alfred[1]	GCMX	135	King Line, Ltd.	300, **600**	P G ..	X	0.40	—	
King Edward YRW[1] ..	YRW	120	King Line, Ltd.	300, **600**	P G ..	X	0.40	—	
King Lear[1]	GDPR	—	Ocean Salvage Co., Ltd... ..	300, **600**	P G ..	X	0.40	—	
King Orry[1]	MPE	100	Isle of Man S.P. Co., Ltd. ..	300, **600**	P G ..	N	0.40	—	
Kingsbury[1]	YDT	—	Alexander S.S. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
King's City[1]	LSW	160	St. Just S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Kingsmere[1]	ZRB	170	Grahams & Co.	300, **600**	P G ..	X	0.40	—	
Kinsale[1]	XEJ	140	Tree S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Kioto[1]	XEV	135	Hall Line, Ltd.	300, **600**	P G ..	X	0.40	—	
Kirkstall Abbey[1] ..	GBVC	—	David S.S. Co., Ltd.	300, 450, **600**	P G ..	X	0.40	—	
Kirktown[1]	BKN	145	Town Line (London), Ltd. ..	300, **600**	P G ..	X	0.40	—	
Kirkwood[1]	EPG	130	W. France, Fenwick & Co., Ltd...	300, **600**	P G ..	X	0.40	—	
Kirnwood[1]	MGX	140	Constantine & Pickering S.S. Co.	300, **600**	P G ..	X	0.40	—	
Kittiwake[1]	GBYQ	130	Cork S.S. Co., Ltd.	300, **600**	P G ..	X	0.05[20]	0.50[20]	
Knebworth[1]	GDCL	—	Robert Stanley Shipping Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Knight Companion[1] ..	GKS	240	Ocean S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Knight Errant[1] ..	GDFZ	—	Knight Errant Tug Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Knight of the Garter[1] ..	MSO	170	China Mutual S.S. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Knight Templar[1] ..	GKT	200	Ocean S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	

Knockfierna[1]	GCKY	170	Limerick S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Knowsley Hall[1]	YYW	—	Hall Line, Ltd.	300, 600	P G ..	X	0.40	—
Kolpino[1]	ODL	120	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.15[21]	1.50[21]
Konigin Luise[1] ..	GBLF	—	Orient S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Koranna[1]	GYY	150	Ellerman & Bucknall S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Koranton[1]	GDBN	—	R. Chapman & Son, Ltd... ..	300, 600	P G ..	X	0.40	—
Korean Prince[1] ..	YRS	—	Prince Line, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Kotka[1]	ODM	130	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.40	—
Koursk BTA[1]	BTA	230	Royal Mail Steam Packet Meat Transports Ltd.	300, 600	P G ..	X	0.40	—
Kovno[1]..	ODN	125	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.15[21]	1.50[21]
Krasnoiarsk XUC[1] ..	XUC	—	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Kronenfels[1]	GBCD	—	J. Chambers & Co.	300, 600	P G ..	X	0.40	—
Kumara[1]	YWT	270	Shaw, Savill & Albion Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Kumeric[1]	GJQ	250	A. Weir & Co.	300, 600	P G ..	N	0.40	—
Kura[1]	XJJ	140	Petroleum S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Kurdistan[1]	GRJ	130	Hindustan S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Kurmark[1]	EKY	180	Grahams & Co.	300, 600	P G ..	X	0.40	—
Kurow[1]	GDZS	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Kut[1]	YLF	180	Kaye, Son & Co., Ltd.	300, 600	P G ..	X	0.40	—
Kut Sang[1]	GFKW	—	Indo-China Steam Nav. Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Kwai Sang[1]	GCSN	—	Indo China S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Kwarra[1]	ZMT	180	Imperial Direct Line, Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Labicum[1]	LUP	135	Rowe S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Lackawanna GJV[1] ..	GJV	135	Anglo-American Oil Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Lackenby[1]	BTR	140	Sir R. Ropner & Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Lady Astley[1]	EZS	145	Dawson Line, Ltd.	300, 600	P G ..	X	0.40	—
Lady Brassey[1] ..	GOS	90	Dover Harbour Board	150, 300	P ..	X	—	—
Lady Carlow[1] ..	GFCM	—	British & Irish S.P. Co., Ltd. ..	300, 600	P G ..	X	0.10[20]	1.00[20]
Lady Cloe[1]	BDN	150	Brit. & Irish S.P. Co., Ltd. ..	300, 600	P G ..	X	0.05[20]	0.50[20]
Lady Crundall[1] ..	GQR	90	Dover Harbour Board	300, 600	P G ..	X	0.40	—
Lady Denison Pender[1]	GDQJ	140	Eastern Telegraph Co., Ltd. ..	300, 450, 600	P ..	X	0.40	—
Lady Duncannon[1] ..	GCTO	—	Dover Harbour Board	300, 600	P ..	X	—	—
Lady Kerry[1]	GFBR	—	British & Irish S.P. Co., Ltd. ..	300, 600	P G ..	X	0.10[20]	1.00[20]
Lady Killiney[20] ..	GBLK	100	British & Irish S.P. Co., Ltd. ..	300, 600	P G ..	X	0.10[20]	1.00[20]
Ladykirk[1]	YGU	130	Seville & U.K. Carrying Co., Ltd	300, 600	P G ..	X	0.40	—
Lady Rhondda[1] ..	ZIA	105	Redlands S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Lady Wicklow[1] ..	GFBS	—	British & Irish S.P. Co., Ltd. ..	300, 600	P G ..	X	0.10[20]	1.00[20]
Lady Wimborne[1] ..	XFU	140	Brit. & Irish S.P. Co., Ltd. ..	300, 600	P G ..	X	0.05[20]	0.50[20]
Labore[1]	GDBZ	—	P. & O. S.N. Co...	300, 600	P G ..	X	0.40	—
Lakonia[1]	GPW	170	Donaldson Line, Ltd.	300, 600	P G ..	X	0.40	—
Lalande[1]	GDQN	—	Lamport & Holt, Ltd.	300, 600	P G ..	X	0.40	—
Lama[1]	GJN	140	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Lamington[1]	ETF	140	National S.S Co., Ltd.	300, 600	P G ..	X	0.40	—
Lancashire[20]	YHS	300	Bibby S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Lancaster Castle[1] ..	GCKR	—	Lancashire S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Lancastrian[1]	MBP	200	F. Leyland & Co., Ltd.	300, 600	P G ..	N	0.40	—
Lancastrian Prince[1] ..	GFDW	—	Prince Line, Ltd.	300, 450, 600	P G ..	X	0.40	—
Langley[1]	GDBR	—	Fratres, Ltd.	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Langton Hall [1]	ELS	145	Hall Line, Ltd.	300, **600**	P G	X	0.40	—	
La Nina [1]	BGI	140	H. M. Grayson	300, **600**	P G	X	0.40	—	
Lanuvium	YLI	180	Rome S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Laomedon [1]	ZSZ	200	China Mutual S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
La Paz [2]	GDLQ	300	Pacific Steam Navigation Co.	300, 450, **600**	P G	X	0.40	—	
Laplace LUV [1]	LUV	170	L'pool Brazil & River Plate S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Lapland [1]	YYE	200	International Navigation Co., Ltd.	300, **600**, 2100[26], 2200[26]	P G	N	0.40	—	
La Plata GBKF [1]	GBKF	—	Ellerman's Wilson Line, Ltd.	300, **600**	P G	X	0.40	—	
Largo [1]	YYO	140	Pelton S.S. Co., Ltd.	300, **600**	P G	X	0.15[20]	1.50[20]	
Largo Law [1]	ZOH	145	Law S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Laristan [1]	YAM	120	Hindustan S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Larne [1]	ZRA	200	Zurbaron S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
La Rosarina [1]	GJW	170	British & Argentine S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Laurel Branch [1]	ZZG	135	Nautilus S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Laurelleaf [1]	EYC	180	Anglo-Saxon Petro. Co., Ltd.	300, **600**	P G	X	0.40	—	
Laurelpark [1]	GFMZ	—	Denholm Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
La Valette [1]	BDU	—	H. M. Grayson	300, **600**	P G	X	0.40	—	
Lawrence	GCVQ	180	Indian Government	300, **600**	P G	X	0.40	—	
Leafield [1]	GXT	145	Donald & Taylor	300, **600**	P G	X	0.40	—	
Leapark [1]	GBMZ	180	J. & J. Denholm, Ltd.	300, **600**	P G	X	0.40	—	
Le Coq EYO [1]	EYO	—	Le Coq S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Leeds City [1]	ERB	150	St. Just S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Leicester [1]	GBCP	—	Anglo-European S.S. Coal & Pitwood Co., Ltd.	300, **600**	P G	X	0.40	—	
Leicestershire [28]	MYL	300	Bibby S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Leighton [28]	GBZV	350	Liverpool, Brazil and River Plate S.N. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Leitrim [9]	ZBT	190	Union S.S. Co. of New Zealand, Ltd	300, **600**	P G	X	0.40	—	
Lemberg [17]	GDFS	150	Maritime Trust Corporation, Halifax (N.S.)	300, **600**	P	X	0.40	—	
Lena [1]	MDX	145	Mercantile S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Leonard [1]	YNX	—	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Leominster [1]	BCS	100	Anglo-European S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Lepanto ZBA [1]	ZBA	210	Ellerman's Wilson Line, Ltd.	300, **600**	P G	X	0.40	—	
Lesto [1]	XKG	130	Pelton S.S. Co., Ltd.	300, **600**	P G	X	0.05[20]	0.50[20]	
Lestris GCXS [1]	GCXS	—	Cork S.S. Co., Ltd.	300, 450, **600**	P G	X	0.10[20]	1.00[20]	
Letitia [1]	GFDN	—	Anchor Donaldson, Ltd	300, 450, **600**	P G	X	0.40	—	

Levant II.[9]	GJY	110	Eastern Telegraph Co., Ltd.	300, 450, 600	P	X	0.40	—
Levenpool[1]	ENT	140	Pool S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Levensau[1]	XKJ	115	Everett & Newbigin	300, 600	P G	X	0.40	—
Levnet[1]	YCU	150	Gordon S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Lexington ZAY[1]	ZAY	190	Furness, Withy & Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Lhasa[1]	GKF	170	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Liberty ZCE[1]	ZCE	—	Viscount Tredegar	300, 600	P G	X	0.40	—
Limax[1]	YNX	—	Anglo-Saxon Petroleum Co., Ltd.	300, 600	P G	X	0.40	—
Lime Branch[1]	YPH	170	Nautilus S.S. Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Limnea[1]	GFLJ	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, 600	P G	X	0.40	—
Lindenhall[1]	EZM	145	West Hartlepool S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Linga[1]	GLJ	160	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Lingfield[1]	YDW	145	Woodfield S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Lisbon[1]	GDTL	175	Ellerman Lines, Ltd.	300, 450, 600	P G	X	0.40	—
Livingstonia[1]	YLN	150	S.S. Livingstonia, Ltd.	300, 600	P G	X	0.40	—
Livorno[1]	ODO	125	Ellerman's Wilson Line, Ltd.	300, 600	P G	X	0.40	—
Lizard[1]	GFLY	—	Clyde Shipping Co., Ltd.	300, 450, 600	P G	X	—	—
Llanberis[1]	ZSI	150	Llanberis, S.S. Co., Ltd.	300, 600	P G	X	0.40	—
L'angollen[1]	YXE	150	Llangollen S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Llangorse[1]	EXF	150	Llangorse S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Llanstephan Castle[1]	MJT	230	Union-Castle Mail S.S. Co., Ltd.	300, 600	P G	N	0.40	—
Llanthony Abbey[1]	ENP	—	Allen Adams & Co., Ltd.	300, 600	P G	X	0.40	—
Lobos[3]	GDXL	300	P.S.N. Co.	300, 450, 600	P G	X	0.40	—
Logic[1]	LSL	120	Belfast S.S. Co., Ltd.	300, 600	P G	X	0.05	0.50
Logician[1]	ENW	170	Charente S.S. Co.	300, 600	P G	X	0.40	—
Lolworth[1]	GDMK	—	John Hudson & Co., Ltd.	300, 600	P G	X	0.05[20]	0.50[20]
Lombardy[25]	GDZQ	100	David MacIver, Sons & Co., Ltd.	300, 600	P G	X	0.40	—
Lompoc[1]	ENH	170	Bear Creek Oil & Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Londonderry[3]	GPR	150	Midland Railway Co.	300, 400, 600[24]	P R	N	0.40	—
Longhirst[25]	GDYN	100	Tanfield S.S. Co., Ltd.	300, 600	P G	X	0.10[20]	1.00[20]
Longnewton[1]	ZPW	105	D. N. Grimes	300, 600	P G	X	0.40	—
Longships[1]	GFLZ	—	Clyde Shipping Co., Ltd.	300, 450, 600	P G	X	0.10[20]	1.00[20]
Loos[1]	OFV	140	Union Shipping & Trading Co., Ltd.	300, 600	P G	X	0.40	—
Lord Antrim[1]	ZDM	150	Ulster S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Lord Broughton[1]	GBZF	—	Byron S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Lord Byron[1]	ZVL	150	Byron S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Lord Downshire	YDY	145	Ulster S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Lord Erskine[1]	GBXN	—	Byron S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Lord Guildford	GCNX	—	Byron S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Lord Harrington[1]	GBSK	—	Byron S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Lord Kelvin[3]	YRC	250	Anglo-American Tel. Co., Ltd.	300, 600	P	X	0.40	—
Lord Londonderry[1]	GCWY	180	Ulster S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Lord Rhondda[3]	YFV	110	Redlands Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Lord Sefton[1]	ZVB	150	Occidental & Oriental S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Lorenzo[1]	GBDY	—	Ellerman & Bucknall S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Lorettia[1]	GFDS	—	Donaldson Line, Ltd.	300, 450, 600	P G	X	0.40	—
Lorina[3]	XMB	200	L. & S.W. Railway Co.	300, 600	P G	X	0.15[10]	1.50[10]

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Losada [2]	GDXM	300	Pacific S.N. Co.	300, 450, **600**	P G	X	0.40	—	
Lothar Bohlen [1]	GFMT	—	Motor Schooners, Ltd.	300, **600**	P G	X	0.40	—	
Loughborough [1]	BMR	—	Anglo-European S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Louisiana GCDM [1]	GCDM	—	Fothergill & Co., Ltd.	300, **600**	P G	X	0.40	—	
Lowlands [1]	BFJ	145	Lowlands Steam Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Lowmead [1]	YIK	145	Western Counties Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Lowther Castle [1]	ZRX	140	Lancashire Shipping Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Loyal Citizen	YCK	145	Loyal Line, Ltd.	300, **600**	P G	X	0.40	—	
Loyal Devonian [1]	YXM	—	Loyal Line, Ltd.	300, **600**	P G	X	0.40	—	
Lucellum [1]	ZWP	—	H. E. Moss & Co's. Tankers, Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2400	0.40	—	
Lubeck GBYT [1]	GBTY	—	Turner, Brightman & Co.	300, **600**	P G	X	0.40	—	
Luceric [1]	YHH	155	A. Weir & Co.	300, **600**	P G	X	0.40	—	
Lucerna [1]	MUI	—	Maritime Investments, Ltd.	300, **600**	P G	X	0.40	—	
Luchana [1]	OCB	150	Clyde Comm. S.S.'s Ltd.	300, **600**	P G	X	0.40	—	
Lucient [1]	OFS	100	Gas Light & Coke Co.	300, **600**	P G	X	0.05[20]	0.50[20]	
Lucie Woermann [1]	GBDS	—	New Zealand Ship. Co., Ltd.	300, **600**	P G	X	0.40	—	
Lucigen [1]	EMJ	160	Lucigen S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Luciline [1]	EYP	160	Luciline Nav. Co., Ltd.	300, **600**	P G	X	0.40	—	
Luga [1]	XKN	135	Bolivian Gen. Enterprise, Ltd.	300, **600**	P G	X	0.40	—	
Lumen [1]	MBE	170	Lumen S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Lumina [1]	YFC	160	Lumina S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2400	0.40	—	
Luneberg [1]	GCVZ	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Lunka [1]	GLM	200	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Lutetian [1]	EYQ	155	Lutetian Nav. Co., Ltd.	300, **600**	P G	X	0.40	—	
Lutterworth [8]	GFBV		G. C. Railway Co.	300, **600**	P G	X	0.10[10]	1.00[11]	
Lycaon [1]	YOZ	240	China Mutual S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	

Lydia YEY[1]	YEY	200	[illegible]	300, 600	P G	X	0.40	—
Lynton Grange[1]	ZEN	130	Houlder Line, Ltd.	300, 600	P G	X	0.40	—
Lynntown[1]	OCU	—	Town Line (London), Ltd.	300, 600	P G	X	0.40	—
Lys[1]	GDQL	—	Normandy Shipping Co., Ltd.	300, 600	P G	X	0.15[21]	1.50[21]
Mabriton[1]	GDBM	—	R. Chapman & Sons	300, 600	P G	X	0.40	—
Macabi[22]	GFYT	500	Unifruitco S.S. Co., Ltd.	300, 600	P G	N	0.40	—
Macedonia MML[1]	MML	230	P. & O. S.N. Co.	300, 600	P G	X	0.40	—
Machaon[1]	GDPS	—	Ocean S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Macharda[1]	XJQ	155	Rankin Gilmour & Co.	300, 600	P G	X	0.40	—
Mackay-Bennett[3]	MMB	400	Commercial Cable Co.	300, 450, 600	P	X	—	—
Mackinaw[1]	YOL	200	Atlantic Transport Co., Ltd.	300, 600	P G	X	0.40	—
Mackworth[1]	BKO	—	Watergate S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Macoris[1]	LTO	—	Tres, Ltd.	300, 600	P G	X	0.40	—
Madame Midas[1]	GDSX	—	T. G. Beatley & Son	300, 600	P G	X	0.40	—
Madawaska BFM[1]	BFM	140	Bank Line, Ltd.	300, 600	P G	X	0.40	—
Madras[1]	MSH	250	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Madras City[1]	ZWH	160	St. Just S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Madura[1]	GDMX	—	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Magdala[1]	YGS	145	S.S. Magdala & Co., Ltd.	300, 600	P G	X	0.40	—
Magdalena[1]	GUC	250	Royal Mail S.P. Co.	300, 600	P G	N	0.40	—
Magdapur[2]	GDXZ	125	T. & J. Brocklebank, Ltd.	300, 450, 600	P G	X	0.40	—
Magellan[2]	GBZQ	150	P.S.N. Co.	300, 450, 600	P G	X	0.40	—
Magician[1]	EYZ	170	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Magic Star[1]	GCTR	—	Blue Star Line, Ltd.	300, 450, 600	P G	X	0.40	—
Magnet[3]	MEH	140	Eastern Extension, Aust. & China Tel. Co., Ltd.	300, 600	P	X	0.40	—
Magpie[1]	GDTP	—	G. & J. Burns, Ltd.	300, 600	P G	X	0.10[20]	1.00[20]
Mahana[1]	LTV	240	Shaw, Savill & Albion Co., Ltd.	300, 600	P G	X	0.40	—
Mahanada[3]	GVJ	130	T. & J. Brocklebank, Ltd.	300, 600	P G	X	0.40	—
Maharaja[1]	GDVR	—	Asiatic S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Maheno[9]	GDZT	325	Union S.S. Co. of N.Z., Ltd.	300, 600	P G	X	0.20	—
Mahia[1]	LTW	200	Shaw, Savill & Albion Co., Ltd.	300, 600	P G	X	0.40	—
Mahmoudieh[1]	GCMB	—	Khedival Mail S.S. & Graving Dock, Co., Ltd.	300, 600	P G	X	0.40	—
Mahopac YOM[1]	YOM	160	Atlantic Transport Co., Ltd.	300, 600	P G	X	0.40	—
Mahratta[1]	OCM	160	T. & J. Brocklebank, Ltd.	300, 600	P G	X	0.40	—
Mahronda[1]	EKM	180	T. & J. Brocklebank, Ltd.	300, 600	P G	X	0.40	—
Mahsud[1]	XFC	140	T. & J. Brocklebank, Ltd.	300, 600	P G	X	0.40	—
Maidan[3]	GVN	130	T. & J. Brocklebank, Ltd.	300, 600	P G	X	0.40	—
Maid of Andros[1]	GBKR	—	Byron S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Maid of Chios[1]	GBPY	—	Byron S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Maid of Corfu[1]	GDKT	—	Byron S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Maid of Crete[1]	GFNX	—	Byron S.S. Co., Ltd.	300, 450, 600	P G	X	0.40	—
Maid of Delos[1]	GFNW	—	Byron S.S. Co., Ltd.	300, 450, 600	P G	X	0.40	—
Maid of Orleans[8]	ENJ	—	S.E. & Chatham R. Co. (Managing Committee)	300, 600	P G	X	0.40	—
Maid of Patras[1]	GBPN	—	Byron S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Maid of Syra[1]	GBFN	—	Byron S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Maid of Tenos[1]	GBPV	—	Byron S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Maihar[1]	LUQ	210	T. & J. Brocklebank, Ltd.	300, 600	P G	X	0.40	—
Maimoa[1]	GDPZ	—	Shaw, Savill & Albion Co., Ltd.	300, 600	P G	X	0.40	—
Maimyo[1]	XJO	125	Well Ltd.	300, 600	P G	X	0.40	—
Main[1]	GBKS	—	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Maindy Abbey[1]	EOP	145	Maindy Ship Co., Ltd.	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Maindy Bridge [2]	GDJX	100	Maindy Shipping Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Maindy Court [1]	EPC	130	Maindy Ship Co., Ltd.	300, **600**	P G	X	0.40	—	
Maindy Dene [1]	YJL	135	Maindy Ship Co., Ltd.	300, **600**	P G	X	0.40	—	
Maindy Forest [1]	XIG	—	Maindy Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Maindy Grange	YDR	—	Maindy Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Maindy Hill [1]	YQV	—	Maindy Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Maindy House [1]	GCBQ	—	Maindy Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Maindy Lodge [1]	GBWK	—	Maindy Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Maindy Manor [1]	EPB	150	Maindy Ship Co., Ltd.	300, **600**	P G	X	0.40	—	
Maindy Priory [2]	GCBN	100	Maindy Shipping Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Maine GDCK [1]	GDCK	—	Atlantic Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
Majestic BEX	BEX	135	W. H. Cockerline & Co.	300, **600**	P G	X	0.40	—	
Makalla [1]	ESA	155	T. & J. Brocklebank, Ltd.	300, **600**	P G	X	0.40	—	
Makura [9]	GDZV	250	Union S.S. Co. of N.Z., Ltd.	300, **600**	P G	X	0.20	—	
Malakand [1]	MKX	200	T. & J. Brocklebank, Ltd.	300, **600**	P G	X	0.40	—	
Malakuta [2]	GVI	130	T. & J. Brocklebank, Ltd.	300, 450, **600**	P G	X	0.40	—	
Malancha [1]	XJP	125	T. & J. Brocklebank, Ltd.	300, **600**	P G	X	0.40	—	
Malantian [1]	EML	170	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
Malayan [1]	ESC	200	Burns, Philp & Co., Ltd.	300, **600**	P G	X	0.40	—	
Malda [1]	GDNB	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Malia [2]	GDYV	125	T. & J. Brocklebank, Ltd.	300, 450, **600**	P G	X	0.40	—	
Maloja [1]	GFBD	—	P. & O. S.N. Co.	300, **600**	P G	N	0.40	—	
Malta [1]	GKD	250	P. & O. S.N. Co.	300, **600**	P G	X	0.40	—	
Malvern Range [1]	ZGC	180	Neptune S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Malwa [1]	MMD	250	P. & O. S.N. Co.	300, **600**	P G	X	0.40	—	
Mamari [1]	GKE	200	Shaw, Savill & Albion Co., Ltd.	300, **600**	P G	X	0.40	—	
Manaar [1]	LUR	200	T. & J. Brocklebank, Ltd.	300, **600**	P G	X	0.40	—	
Manavi [1]	GYO	170	Pacific S.N. Co.	300, **600**	P G	N	0.40	—	
Manchester Brigade [1]	EKW	155	Manchester Liners, Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Manchester City [1]	GKH	190	**Manchester Liners, Ltd.**	300, **600**	P G	0700 to 2300	0.40	—	
Manchester Civilian [1]	ZQV	155	**Manchester Liners, Ltd.**	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200 [illegible]	0.40	—	
Manchester Corporation [1]	YYB	155	**Manchester Liners, Ltd.**	300, **600**	P G	[illegible]	0.40	—	

Manchester Division[1] ..	BLZ	140	Manchester Liners, Ltd.	300, 600	P G ..	0000 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Manchester Exchange[1]	ZQW	170	Manchester Liners, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Manchester Hero[1] ..	ZBE	170	Manchester Liners, Ltd.	300, 600	P G ..	0700 to 2300	0.40	—
Manchester **Importer**[1]	ZQY	170	Manchester Liners, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Manchester **Mariner**[1] ..	ZQZ	170	Manchester Liners, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Manchester **Merchant**[1]	ZQL	165	Manchester Liners, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Manchester Port[1] ..	ZQN	160	Manchester Liners, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Manchester **Producer**[1]	ZNH	200	Manchester Liners, Ltd.	300, 600	P G ..	X	0.40	—
Manchester **Shipper**[1] ..	ZOF	160	Manchester Liners, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Manchester **Spinner**[1] ..	ZNC	140	Manchester Liners, Ltd. ..	300, 600	P G ..	X	0.40	—
Manchurian[1]	GBFX	—	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.40	—
Manchurian Prince[1] ..	ETV	—	Furness, Withy & Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Manco[1]	GQZ	200	Booth S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Mandala[1]	YTJ	230	British India S.N. Co., Ltd. ..	300, 600 2100[26], 2200[26]	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Mandalay[2]	GWP	150	Burma S.S. Co., Ltd.	300, 600	P G ..	1000 to 1200 1600 to 1800 2000 to 2200	0.40	—
Mandasor[2]	GCXB	125	T. & J. Brocklebank, Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Manela[1]	GDMW	—	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Mangalore[2]	GCXP	125	T. & J. Brocklebank, Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Manhattan GKK[1] ..	GKK	250	Atlantic Transport Co., Ltd. ..	300, 600	P G ..	N	0.40	—
Manica[1]	YZI	—	Ellerman & Bucknall S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Manipur[2]	GCXR	125	T. & J. Brocklebank, Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Manistee[1]	GDCX	—	Elders & Fyffes, Ltd.	300, 600	P G ..	X	0.40	—
Manoa GFQS[1] ..	GFQS	—	Canada S.S. Lines, Ltd... ..	300, 600	P G ..	X	0.40	—
Manora[1]	GIT	230	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Manordilo[1]	GBJY	—	Harries Bros. & Co.	300, 600	P G ..	X	0.40	—
Mansourah GFJQ[1] ..	GFJQ	—	Khedivial Mail S.S. & Graving Dock Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Mantola[1]	GDMY	—	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Mantua[1]	MME	190	P. & O. S.N. Co.	300, 600 2100[26], 2200[26]	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Manuka[2]	GDZW	325	Union S.S. Co. of N.Z., Ltd.	300, **600**	P G	X	0.20	—	
Manx Isles[1]	LTR	170	Manx Isles S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Manxman GFPS[1]	GFPS	—	Isle of Mann S.P. Co., Ltd.	300, **600**	P G	N	0.10[20]	1.00[20]	
Manzanares[1]	MLS	150	Elders & Fyffes, Ltd.	300, **600**	P G	X	0.40	—	
Maori[2]	GDZX	250	Union S.S. Co. of N.Z., Ltd.	300, **600**	P G	X	0.10	0.60	
Maple MSP[1]	MSP	150	Laird Line, Ltd.	300, **600**	P G	X	0.40	—	
Maple Branch[1]	ZIV	250	Nautilus S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Maplemore[1]	ZND	170	Johnston Line, Ltd.	300, **600**	P G	X	0.40	—	
Mapleton[1]	XHD	—	Canadian Northern S. Ships, Ltd.	300, **600**	P G	X	0.40	—	
Marama[2]	GDZY	250	Union S.S. Co., of N.Z., Ltd.	300, **600**	P G	X	0.20	—	
Maraval[1]	GWH	100	Trinidad Shipping & Trading Co., Ltd.	300, 450, **600**	P G	N	0.40	—	
Marconi[1]	ZBC	230	Lamport & Holt, Ltd.	300, **600**	P G	N	0.40	—	
Mardinian[1]	GBWN	—	Ellerman's Lines, Ltd.	300, **600**	P G	X	0.40	—	
Marengo[1]	GKJ	125	Ellerman's Wilson Line, Ltd.	300, **600**	P G	0800 to 1300 1400 to 1700 1800 to 2200	0.40	—	
Maresfield[1]	YQK	140	Woolfield S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Maruba[1]	BOY	170	British India S.N. Co., Ltd.	300, **600**, 2100[26], 2200[26]	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Maria de Larrinaga	EMA	170	Maria de Larrinaga S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Marie Reppell[1]	GDKS	225	Lyle Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Marie Rose YEH[1]	YEH	170	Ellerman's Wilson Line, Ltd.	300, **600**	P G	X	0.40	—	
Marinula	YQW	—	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Maritime[1]	GBMQ	—	William Thomas Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Marlwood[1]	EKO	105	H. A. Brightman & Co.	300, **600**	P G	X	0.15[21]	1.50[21]	
Marmora[1]	MMR	250	P. & O. S.N. Co.	300, **600**	P G	X	0.40	—	
Marnetown[1]	GAX	—	Town Line (London), Ltd.	300, **600**	P G	X	0.40	—	
Maronian[1]	EMN	150	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
Marquesa[1]	ZQD	150	Furness, Houlder & Argentine Lines, Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800	0.40	—	

Marsden [1]	BJJ	105	Burnett S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Marshal Allenby [1]	YFZ	—	Marshal Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Marshal French [1]	MFX	—	Marshal Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Marshal Haig [1]	YLW	—	Marshal Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Marshal Plumer [1]	BGH	140	St. Davids S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Martaban [8]	GWC	150	Brit. & Burmese S.N. Co., Ltd.	300, 450, 600	P G	1000 to 1200 1600 to 1800 2000 to 2200	0.40	—
Martha Russ [1]	GDFP	—	Pelton S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Mary Horlock [1]	GBNZ	170	F. W. Horlock	300, 600	P G	X	0.40	—
Maryland MBW [1]	MBW	170	Atlantic Transport Co., Ltd.	300, 600	P G	X	0.40	—
Marylebone [8]	YMQ	—	Great Central Railway	300, 600	P G	X	0.40	—
Mashobra [1]	GDMS	—	British India S.N. Co., Ltd.	300, 600 2100[26], 2200[26]	P G	X	0.40	—
Masirah	MPX	190	T. & J. Brocklebank, Ltd.	300, 600	P G	X	0.40	—
Maskinonge	YBE	—	Maskinonge S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Massilia [1]	MHQ	230	Henderson Bros. (Anchor Line)	300, 600	P G	X	0.40	—
Massis [1]	ZZE	145	Massis Oil Transport Co., Ltd.	300, 600	P G	X	0.40	—
Masula [1]	GBSQ	230	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Masuria [1]	GBJM	—	Macbeth & Co.	300, 600	P G	X	0.40	—
Matadi [1]	GBCK	170	Elder, Dempster & Co., Ltd.	300, 600	P G	X	0.40	—
Matador [1]	YTC	170	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Matakana [1]	GFDX	—	Shaw, Savill & Albion Co., Ltd.	300, 450, 600	P G	X	0.40	—
Matama [1]	GCMF	—	Khedival Mail S.S. & Graving Dock Co., Ltd.	300, 600	P G	X	0.40	—
Matatua [1]	GKL	200	Shaw, Savill & Albion Co., Ltd.	300, 600	P G	X	0.40	—
Matdana [1]	GDMZ	—	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Mateba [1]	GCLY	150	Elder, Dempster & Co., Ltd.	300, 600	P G	X	0.40	—
Matheran [1]	MMX	200	T. & J. Brocklebank, Ltd.	300, 600	P G	X	0.40	—
Mathura [3]	GCXQ	125	T. & J. Brocklebank, Ltd.	300, 450, 600	P G	X	0.40	—
Matina [1]	MLT	190	Elders & Fyffes, Ltd.	300, 600	P G	X	0.40	—
Matoppo [1]	MAM	145	Ellerman & Bucknall S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Matra [1]	ZZD	180	T. & J. Brocklebank, Ltd.	300, 600	P G	X	0.40	—
Mattawa [1]	YTT	180	Canadian Pacific Rly. Co.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Matura [1]	GYD	180	Trinidad Shipping & Trading Co., Ltd.	300, 600	P G	N	0.40	—
Maunganui [9]	GFYB	250	Union S.S. Co. of N.Z., Ltd.	300, 600	P G	X	0.20	—
Maureen [23]	OCI	100	D. N. Grimes	300, 450, 600	P G	X	0.40	—
Mauretania [1]	MGA	350	Cunard S.S. Co., Ltd.	110, 300, 600 2100[26], 2200[26]	P G	N	0.40	—
Mayari [1]	GDYX	—	Unifruitco S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Mayaro [14]	MFR	170	Trinidad Shipping & Trading Co., Ltd.	300, 600	P G	N	0.40	—
Maymead [1]	EXE	—	Western Counties Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Mecklenburg GCXL [1]	GCXL	—	Royal Mail S.P. Co., Ltd.	300, 600	P G	X	0.40	—
Mecklenburg GDFQ [1]	GDFQ	—	J. & J. Denholm, Ltd.	300, 600	P G	X	0.40	—
Media [1]	ZTC	200	T. & J. Brocklebank, Ltd.	300, 600	P G	X	0.40	—
Median [1]	ZGP	170	F. Leyland & Co., Ltd.	300, 600	P G	N	0.40	—
Medic [1]	MKK	250	Oceanic S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Mediterranean Star [1]	MBM	230	Claude Langdon, Ltd.	300, 600	P G	X	0.40	—
Megantic [1]	MZC	200	Oceanic S.N. Co., Ltd.	300, 600 2100[26], 2200[26]	P G	N	0.40	—

Ship Stations—*Continued.*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Meggie	GCVT	—	James Coermack & Co.	300, **600**	P G	X	0.40	—	
Megna [1]	EQP	200	James Nourse, Ltd.	300, **600**	P G	X	0.40	—	
Meissonier [1]	GWZ	200	Lamport & Holt, Ltd.	300, **600**	P G	N	0.40	—	
Melania [1]	MPP	240	Anglo-Saxon Petro. Co., Ltd.	300, **600**	P G	X	0.40	—	
Melford Hall [1]	GDVN	—	Hall Line, Ltd.	300, **600**	P G	X	0.40	—	
Melita [1]	BNB	270	Canadian Pacific Rly. Co.	300, **600**	P G	N	0.40	—	
Mellifont [6]	YWN	110	Lancs. & Yorks. Railway Co.	300, **600**	P G	N	0.10 [20]	1.00 [20]	
Melmore Head [1]	XJC	150	Ulster S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Melrose GFCS [1]	GFCS	100	Gibson (George) & Co., Ltd.	300, **600**	P G	X	0.10 [20]	1.00 [20]	
Melrose Abbey [1]	XEO	—	Melrose Abbey Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Meltonian [1]	ZGQ	170	F. Leyland & Co., Ltd.	300, **600**	P G	N	0.40	—	
Melville YSE [1]	YSE	200	Elder, Line, Ltd.	300, **600**	P G	X	0.40	—	
Memnon [1]	MIG	155	China Mutual S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Menapian [1]	XIT	200	O. & W. Williams & Co.	300, **600**	P G	X	0.40	—	
Mendip Range [1]	ZRT	180	Neptune S.N. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Menelaus [1]	BET	135	Ocean S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Menevia [2]	GRR	150	London & N.W. Rly. Co.	300, **600**	P G	N	0.05 [20]	0.50 [20]	
Menevian [1]	XEZ	200	O. & W. Williams & Co.	300, **600**	P G	X	0.40	—	
Menominee MNE [1]	MNE	250	Atlantic Transport Co., Ltd.	300, **600**	P G	N	0.40	—	
Mentor [1]	YOA	180	Ocean S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Mercedes BLF	BLF	—	H. Rees, Jones & Co.	300, **600**	P G	X	0 40	—	
Mercedes de Larrinaga [1]	EJN	200	Miguel de Larrinaga S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Merchant [1]	EIG	155	Charente S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Merchant Prince [3]	ZFU	170	Prince Line	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Mercian [1]	YVT	170	F. Leyland & Co., Ltd.	300, **600**	P G	N	0.40	—	
Mercuria [1]	YTM	150	Donaldson Line, Ltd.	300, **600**	P G	N	0.40	—	
Merganser [3]	GCTL	—	Cork S.S. Co., Ltd.	300, **600**	P G	X	0.05 [20]	0.50 [20]	
Merion [1]	MJM	—	International Nav. Co., Ltd.	300, **600**	P G	X	0.40	—	
Merkara [1]	GMY	225	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	

Mersey[3]	MWJ	135	Oceanic S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Merton Hall[1]	GBCW	—	Hall Line, Ltd.	300, 600	P G ..	X	0.40	—
Mesaba[1]	BOV	—	Atlantic Transport Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Mesopotamia[1] ..	BVA	155	Westminster Shipping Co., Ltd ..	300, 600	P G ..	X	0.40	—
Metagama[1]	YZQ	240	Canadian Pacific Rly. Co. ..	300, 600	P G ..	N	0.40	—
Meteor GBSP[1] ..	GBSP	—	Royal Mail Steam Packet Co. ..	300, 600	P G ..	X	0.40	—
Methven[1]	YLZ	175	Canadian Pacific Railway Co. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Mexico MWG[1]	MWG	170	Pacific S.N. Co.	300, 600	P G ..	N	0.40	—
Miami GBFJ[1]	GBFJ	—	Elders & Fyffes, Ltd.	300, 600	P G ..	X	0.40	—
Michael[1]	GWV	—	Booth S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Michaelston[1]	YYP	145	Times Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Michigan GKM[1] ..	GKM	220	Atlantic Transport Co., Ltd. ..	300, 600	P G ..	N	0.40	—
Middleham Castle[1]	ZVJ	145	Lancashire Shipping Co. Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Middlesex GDQB[1] ..	GDQB	—	Federal S.N. Co. Ltd,.	300, 600	P G ..	X	0.40	—
Millais[1]	LST	225	L'pool, Brazil & River Plate S.N. Co., Ltd.	300, 600	P G ..	N	0.40	—
Millpool[1]	LTJ	150	Pool S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Milton BBX[1]	BBX	135	Shakespear Shipping Co., Ltd ..	300, 600	P G ..	X	0.40	—
Miltonstar[1]	YSC	160	Union Cold Storage Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Min[1]	BSL	130	Mercantile S.S. Co., Ltd... ..	300, 600	P G ..	X	0.40	—
Mineric[1]	LSC	150	Bank Line, Ltd.	300, 600	P G ..	X	0.40	—
Minia[3]	GUQ	150	Anglo-American Tel. Co., Ltd. ..	300, 600	P ..	X	—	—
Minna Horn[1]	GBWX	—	Haldin & Co.	300, 600	P G ..	X	0.40	—
Minnedosa[1]	GZX	180	Canadian Pacific Rly. Co. ..	300, 600	P G ..	X	0.40	—
Minnie de Larrinaga[1] ..	MLA	170	Miguel de Larrinaga S.S. Co. Ltd.	300, 600	P G ..	X	0.40	—
Mirzapore[1]	GFBK	—	P. & O. S.N. Co.	300, 600	P G ..	N	0.40	—
Mississippi GRI[1] ..	GRI	200	Atlantic Transport Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Missouri MLG[1] ..	MLG	140	Atlantic Transport Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Mitra[1]	MZH	210	Anglo-Saxon Petro. Co., Ltd.* ..	300, 600	P G ..	X	0.40	—
Moana[9]	GFYC	325	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Modasa[1]	GFDZ	—	British India S.N. Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Moeraki[9]	GFYD	325	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Mokoia[9]	GFYJ	250	Union S.S. Co. of N.Z., Ltd. ..	300, 600	P G ..	X	0.20	—
Mokta[1]	YGA	150	La Tunisienne S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Moldavia[1]	GDVZ	—	P. & O. S.N. Co.	300, 600	P G ..	N	0.40	—
Molesey[1]	ZXV	140	Britain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Moliere[1]	ZBN	200	Lamport & Holt, Ltd.	300, 600	P G ..	N	0.40	—
Molton[1]	GCYJ	130	Lord Glanely	300, 600	P G ..	X	0.40	—
Mombassa[12]	ZAK	—	Mombassa S.S. Co. Ltd.	—	—	—	—	—
Mona[1]	GFBY	—	Isle of Man S.P. Co., Ltd. ..	300, 600	P G ..	N	0.10[20]	1.00[20]
Monadnock MIX[1] ..	MIX	150	Bank Line Ltd.	300, 600	P G ..	X	0.40	—
Monarch GTS[18] ..	GTS	100	Postmaster General (Cable Ship)	300, 450, 600	—	—	—	—
Monarch ZBS[1]	ZBS	200	Elder. Line, Ltd.	300, 600	P G ..	X	0.40	—
Mona's Isle	GFPN	—	Isle of Man S.P. Co., Ltd. ..	300, 450, 600	P G ..	N	0.10[20]	1.00[20]
Mona's Queen[1] ..	GFPV	—	Isle of Man S.P. Co., Ltd. ..	300, 600	P G ..	N	0.10[20]	1.00[20]
Monassir[1]	GCMD	—	Khedival Mail S.S. & Graving Co., Ltd.	300, 600	P G ..	X	0.40	—
Monestoy[1]	ZFE	155	Bolivian Gen. Enterprise, Ltd. ..	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Monette [1]	YXG	160	Brown, Jenkinson & Co.	300, **600**	P G	X	0.40	—	
Mongolia GFBJ	GFBJ	—	P. & O. S.N. Co.	300, **600**	P G	N	0.40	—	
Mongolian Prince [1]	YWO	—	Prince Line	300, **600**	P G	X	0.40	—	
Monkshaven	YCJ	145	Rhonda Merthyr Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Monkton [1]	GDBJ	—	Lord Glanely	300, **600**	P G	X	0.40	—	
Montazah [1]	GCLZ	—	Khedival Mail S.S. Co.	—	—	—	—	—	
Montenegro EMQ [1]	EMQ	155	Elder Line, Ltd.	300, **600**	P G	X	0.40	—	
Montgomeryshire [1]	GDBV	—	Royal Mail S.P. Co., Ltd.	300, **600**	P G	N	0.40	—	
Montezuma [1]	XKY	150	Canadian Pacific Railway Co.	300, **600**	P G	X	0.40	—	
Montreal GBKN	GBKN	—	Canadian Pacific Railway Co.	300, **600**	P G	X	0.40	—	
Montrose GCBY [1]	GCBY	—	J. Warrack & Co.	300, **600**	P G	X	0.40	—	
Mooltan [1]	GFBC	—	P. & O. S.N. Co.	300, **600**	P G	N	0.40	—	
Moora [1]	OCA	200	India Office	300, **600**	—	—	—	—	
Moorby	BTP	150	Sir R. Ropner & Co., Ltd.	300, **600**	P G	X	0.40	—	
Moorfoot [1]	GDVM	—	George Gibson & Co., Ltd.	300, **600**	P G	X	0.40	—	
Moorfowl [1]	GDTW	—	G. & J. Burns, Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
Moorish Prince [1]	YYK	190	Prince Line	300, **600**	P G	N	0.40	—	
Morea [1]	MMF	250	P. & O. S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Morinier [1]	YHG	120	Lloyd Royal Belge (Gt. Britain), Ltd.	300, **600**	P G	X	0.40	—	
Morocco [1]	ZVV	210	Ellerman's Wilson Line, Ltd.	300, **600**	P G	0900 to 1300 1500 to 1800 2000 to 2300	0.40	—	
Mortlake [1]	YNE	145	Britain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Morton Abbey [1]	GCXY	—	David S.S. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Morvada [1]	MUP	230	British India S.N. Co., Ltd.	300, **600**, 2100[26], 2200[26]	P G	X	0.40	—	
Mostyn [2]	GDWY	100	Meryn S.S. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Motagua [1]	MPN	230	Elders & Fyffes, Ltd.	300, **600**	P G	X	0.40	—	
Moto [1]	GDBS	—	Pelton S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Mottisfont [1]	YFL	170	Canadian Pacific Ocean Services, Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Mount Berwyn [1]	BBM	150	Sefton S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Mount Etna [1]	YNK	155	Sefton S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Mount Everest [1]	XLM	150	Sefton S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Mount Snowdon [1]	EZO	150	Sefton S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	

Mourino[1]	HNK	—	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	0900 to 1300 1500 to 1800 2000 to 2300	0.40	—
Moyle[1]	GFNJ	—	Normandy Shipping Co., Ltd. ..	300, 600	P G ..	X	0.15[21]	1.50[21]
M. S. Dollar[1] ..	BCJ	—	Dollar S.S. Lines, Ltd.	300, 600	P G ..	X	0.40	—
Mull[1]	GXM	130	Isles S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Mumbles Light[1] ..	YTD	150	German Bros.	300, 600	P G ..	X	0.40	—
Munardan[1]	GQP	180	Crossburn S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Muncaster Castle[1] ..	ZAX	160	Lancashire Ship Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Mundra[1]	GDMT	—	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Munergic[1]	XIL	180	Crossburn S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Munster[1]	MCQ	170	City of Dublin Steam Packet Co.	300, 600	P G ..	N	0.05[20]	0.50[20]
Murillo[1]	YTH	220	Lamport & Holt, Ltd.	300, 600	P G ..	N	0.40	—
Muristan[1]	GCZW	—	Strick Line, Ltd.	300, 600	P G ..	N	0.40	—
Musician[1]	MAD	170	Charente S.S. Co.,..	300, 600	P G ..	X	0.40	—
Muttra[1]	GMJ	170	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Myrmidon[1]	ZKK	170	China Mutual S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Myrshell	YYD	—	Anglo-Saxon Pet. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Myrtlepark[1]	GFJW	—	Denholm Shipping Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Mytilus[1]	ZKU	200	Anglo-Saxon Petro. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Nagara[1]	LTZ	200	Royal Mail Steam Packet Meat Transports, Ltd.	300, 600	P G ..	X	0.40	—
Nagoya[1]	GCD	220	P. & O. S.N. Co.	300, 600	P G ..	X	0.40	—
Nagpore[1]	GDBW	—	P. & O. S.N. Co.	300, 600	P G ..	X	0.40	—
Naldera[1]	GCTZ	140	P. & O. S.N. Co.	300, 600	P G ..	N	0.40	—
Namsang[1]	YVJ	170	Indo-China S.N. Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Naneric[1]	GKO	190	A. Weir & Co.	300, 600	P G ..	N	0.40	—
Nankin[1]	GKP	200	P. & O. S.N. Co.	300, 600	P G ..	X	0.40	—
Napierian[1]	ZGS	170	F. Leyland & Co., Ltd.	300, 600	P G ..	N	0.40	—
Nardana[1]	GCLF	200	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Narenta GBQY[1] ..	GBQY	—	Royal Mail S.P. Co., Ltd. ..	300, 600	P G ..	N	0.40	—
Nariva[1]	GCNT	—	Royal Mail S.P. Meat Transports, Ltd.	300, 600	P G ..	N	0.40	—
Narkunda[1]	GCVB	—	P. & O. S.N. Co., Ltd.	300, 600, 2100[26], 2200[26]	P G ..	N	0.40	—
Narragansett GCYT[1] ..	GCYT	—	Anglo-American Oil Co., Ltd. ..	300, 600	P G ..	N	0.40	—
Narva[1]	ODP	110	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.15[21]	0.90[21]
Nascopie[1]	ZPC	180	Hudson's Bay Co.	300, 600	P G ..	X	0.40	—
Nash Light[1]	GBYZ	125	British Channel Steamers, Ltd.	300, 450, 600	P G ..	X	0.40	—
Nasmyth[1]	GBPX	170	Liverpool, Brazil and River Plate S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Nassa[1]	GFLR	—	Anglo-Saxon Pet. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Natia[1]	GCNS	—	Royal Mail S.P. Meat Transports, Ltd.	300, 600	P G ..	N	0.40	—
Natica[1]	MZN	220	Anglo-Saxon Petro. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Navahoe MEN[1] ..	MEN	200	Anglo-American Oil Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Navarino[1]	ZTT	140	Glasgow Shipowners' Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Navasota[1]	EJT	130	Royal Mail Steam Packet Meat Transports, Ltd.	300, 600	P G ..	N	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Navigator [1]	EIH	180	Charente S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Navua [9]	GFYK	250	Union S.S. Co. of N.Z., Ltd.	300, **600**	P G	X	0.20	—	
Nawab [1]	ZQT	170	Asiatic S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Neath Abbey [2]	GDYF	100	Melrose Abbey Shipping Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Nebraska GBQZ [1]	GBQZ	—	Royal Mail S.P. Co., Ltd.	300, **600**	P G	N	0.40	—	
Neebing [1]	ODH	120	Silverdale S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Needwood [1]	EOZ	125	W. France, Fenwick & Co., Ltd.	300, **600**	P G	X	0.40	—	
Neko [1]	EOQ	180	Chr. Salvesen & Co.	300, **600**	P G	X	0.40	—	
Nelda [1]	GCZY	—	James McKelvie	300, **600**	P G	X	0.40	—	
Neleus [1]	ZKL	200	China Mutual S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Nellore [1]	MEW	220	P. & O. S.N. Co.	300, **600**	P G	X	0.40	—	
Nembe [1]	YMF	160	Brit. & African S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Nemesis [3]	MSM	150	Lindsay, Swan & Hunter, Ltd.	300, **600**	P	X	—	—	
Neotsfield [1]	GCKS	—	Neotsfield Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Nerbudda [1]	GBML	230	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Nessian [1]	GPV	160	F. Leyland & Co., Ltd.	300, **600**	P G	X	0.40	—	
Nestor [1]	GBQ	270	Ocean S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Nethermead [1]	GVQ	—	Western Counties Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Netley Abbey [1]	GBKQ	—	David S.S. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Neuralia [1]	GCV	220	British India S.N. Co., Ltd.	300, **600**, 2100[26], 2200[26]	P G	X	0.40	—	
Neva LTU [1]	LTU	130	Stott Line, Ltd.	300, **600**	P G	X	0.40	—	
Nevasa [1]	GBG	250	British India S.N. Co., Ltd.	300, **600**, 2100[26], 2200[26]	P G	X	0.40	—	
Nevisian [1]	EOG	160	F. Leyland & Co., Ltd.	300, **600**	P G	N	0.40	—	
Newaster [1]	BMB	150	Aster Shipping Co.	300, **600**	P G	X	0.40	—	
Newbigging [1]	BGN	120	J. Mitchell & Sons	300, **600**	P G	X	0.40	—	
New Brighton [1]	GDCR	—	African S.S. Co.	300, **600**	P G	X	0.40	—	
New Brooklyn [1]	GDPB	—	British and African S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
New Brunswick [1]	GBSW	180	Elder, Dempster & Co., Ltd.	300, **600**	P G	X	0.40	—	
Newby Hall [1]	ZOE	140	Hall Line, Ltd.	300, **600**	P G	X	0.40	—	
New Columbia [1]	GDCS	—	African S.S. Co.	300, **600**	P G	X	0.40	—	
New Georgia [1]	GBSY	190	Elder, Dempster & Co., Ltd.	300, **600**	P G	X	0.40	—	
Newhaven ZCJ [8]	ZCJ	160	L. B. & S. Coast Rly.	300, 450, **600**	P G	N	0.40	—	
Newlands [1]	ZYO	140	Italian Export Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
New Londoner [24]	GBRZ	100	Tyne-Tees Steam Shipping Co., Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
New Mexico [1]	GBSX	190	Elder, Dempster & Co., Ltd.	300, **600**	P G	X	0.40	—	
Newquay [1]	BDK	120	Newcastle S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
New Texas [1]	GCLW	—	Elder, Dempster & Co., Ltd.	300, **600**	P G	X	0.40	—	

Newton GBTJ [1] ..	GBTJ	—	Lamport & Holt, Ltd.	300, 600	P G ..	X	0.40	—
New Toronto [1] ..	GCLV	200	Elder, Dempster & Co., Ltd. ..	300, 600	P G ..	X	0.40	—
New York City [1] ..	BQU	145	C. Hill & Sons	300, 600	P G ..	X	0.40	—
Ngakuta	BHP	200	Blackball Coal Co..	300, 600	P G ..	X	0.40	—
Niagara [2]	GBE	250	Union S.S. Co. of New Zealand, Ltd.	300, 600	P G ..	N	0.40	—
Niceto de Larrinaga [1] ..	ZNS	170	Miguel de Larrinaga S.S. Co., Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Nicoya [1]	MLV	150	Elders & Fyffes, Ltd.	300, 600	P G ..	X	0.40	—
Nictheroy	GBRF	—	Royal Mail S.P. Co., Ltd. ..	300, 600	P G ..	N	0.40	—
Nienburg [1]	GBYS	—	J. Chambers & Co.	300, 600	P G ..	X	0.40	—
Nile GCYV [1]	GCYV	—	Glen & Co.	300, 600	P G ..	X	0.40	—
Nilemede [1]	XJM	150	D. & T. G. Adams..	300, 600	P G ..	X	0.40	—
Nina (La) [1]	BGI	140	H. M. Grayson	300, 600	P G ..	X	0.40	—
Ningchow [1]	YOV	200	China Mutual S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Ninian [1]	MEB	170	F. Leyland & Co., Ltd.	300, 600	P G ..	N	0.40	—
Ninive [1]	GCWP	180	British India S.N. Co., Ltd. ..	300, 600	P G ..	N	0.40	—
Nirpura [1]	GFJD	—	British India S.N. Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Nirvana [1]	MZW	270	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Nitokris [1]	GBZS	—	Pacific S.N. Co.	300, 600	P G ..	X	0.40	—
Nitonian [1]	YSD	170	F. Leyland & Co., Ltd.	300, 600	P G ..	N	0.40	—
Nivose [1]	YMX	150	Plisson S.S. Co., Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Nizam [2]	YBC	—	Asiatic S.N. Co., Ltd.	300, 600	P G ..	X	—	—
Nobia [1]	GFLS	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Noelle [1]	YLC	—	P. Samuel & Co., Ltd.	300, 600	P G ..	X	0.40	—
Nolisement [1]	GVO	130	Breynton S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Norburn [1]	XID	120	Coombes, Marshall & Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Nore [1]	GKV	210	P. & O. S.N. Co.	300, 600	P G ..	X	0.40	—
Norfolk Range [1] ..	BUG	100	Neptune S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Norman [1]	MOM	200	Union-Castle Mail S.S. Co., Ltd..	300, 600	P G ..	N	0.40	—
Normandier [1]	YBO	—	Lloyd Royal Belge (Great Britain), Ltd.	300, 600	P G ..	X	0.40	—
Norman Monarch [1] ..	YQL	175	Monarch S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Normannia GKW [1] ..	GKW	170	L. & S.W. Railway Co., Ltd. ..	300, 600	P G ..	N	0.15 [10]	1.50 [10]
Normanstar [1]	ZXR	—	Blue Star Line, Ltd.	300, 600	P G ..	X	0.40	—
Norriston [1]	ZBY	120	Norriston S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Norseman [2]	MEG	140	Western Telegraph Co.	300, 600	P ..	—	—	—
Northborough [1] ..	YCE	140	Hazelwood Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
North Britain [2] ..	ETQ	140	North Ship Co., Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Northern [1]	BCV	—	J. Mathias & Sons..	300, 600	P G ..	—	0.40	—
North Pacific [1]	ZSK	170	Felix S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
North Sands [1]	GOU	145	Union Chartering Co.	300, 600	P G ..	X	0.40	—
Northumberland [1] ..	ZBL	180	Federal S.N. Co., Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
North Western Miller [1]	MTV	200	Norfolk & N.American S.S. Co.,Ltd.	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Norton [1]	OEH	140	Furness, Withy & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Nortonian [1]	MEO	170	F. Leyland & Co., Ltd.	300, **600**	P G	N	0.40	—	
Norwegian [1]	GDMC	—	F. Leyland & Co., Ltd.	300, **600**	P G	X	0.40	—	
Norwich City [1]	EXB	145	St. Just S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Notanda [1]	XFZ	100	Gordon S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Nottingham [3]	ZCO	—	Great Central Railway	300, **600**	P G	X	0.40	—	
Notton [1]	GCZV	—	Atlantic Shipping & Trad. Co., Ltd.	300, **600**	P G	X	0.40	—	
Novara [1]	GCW	200	P. & O. S.N. Co.	300, **600**	P G	X	0.40	—	
Novgorod ZOG [1]	ZOG	250	Royal Mail Steam Packet Co.	300, **600**	P G	N	0.40	—	
Novian [1]	YPG	170	F. Leyland & Co., Ltd.	300, **600**	P G	N	0.40	—	
Novington [1]	ELM	—	Southdown S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Novo [1]	OCK	100	Ellerman's Wilson Line, Ltd.	300, **600**	P G	X	0.15 [21]	1.50 [21]	
Nowshera [1]	ENQ	200	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Nubian [1]	ZGO	170	F. Leyland & Co., Ltd.	300, **600**	P G	N	0.40	—	
Nucula [1]	BHL	170	Anglo-Saxon Petro. Co., Ltd.	300, **600**	P G	X	0.40	—	
Nuddea [1]	GBTW	200	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Nurtureton [1]	ZVH	130	Carlton S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Nuthatch [1]	GFNY	—	Hull S.F. & Ice Co., Ltd.	300, **600**	P G	X	0.10 [20]	1.00 [20]	
Nyanza GKY [3]	GKY	210	P. & O. S.N. Co.	300, **600**	P G	X	0.40	—	
Oak Branch [1]	ETC	170	Nautilus S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Oakfield [1]	MXF	140	Doughty Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Oaklands Grange	ZEQ	140	Houlder Line	300, **600**	P G	X	0.40	—	
Oakwin [1]	XLD	155	Ashwin & Co.	300, **600**	P G	X	0.40	—	
Oanfa [1]	GTL	200	China Mutual S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Obra [1]	GML	200	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Ocean Monarch [3]	EXR	150	Monarch S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Ocean Transport [3]	ZDZ	140	Empire Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
Oehringen [1]	GBPF	150	Lyle Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Offenbach [1]	GCWF	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Okara [1]	GMW	170	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Olavus [1]	GDSC	—	Sir Eric Ohlson	300, **600**	P G	X	0.40	—	
Oliva [1]	ZLO	210	Anglo-Saxon Petro. Co., Ltd.	300, **600**	P G	X	0.40	—	
Olive [1]	GDVC	—	Laird Line, Ltd.	300, **600**	P G	X	0.10 [illegible]	1.00 [illegible]	

Olympia MHI [3]	MHI	175	Henderson Bros. (Anchor Line) ..	300, 600	P G ..	X	0.40	—
Olympic [1] [22]	MKC	400	White Star Line	300, 600, 2100[26], 2200[26]	P G ..	N	0.40	—
Onda [1]	GNL	200	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Onega [1]	GCFD	—	Wm. Thompson & Co.	300, 600	P G ..	X	0.40	—
Onitsha [1]	ZMM	175	Brit. & African S.N. Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Onwen	EPJ	135	Woolston S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Onward [3]	GUM	50	S.E. & Chatham Railway Co.'s Mng. Committee	300, 600	P G ..	N	0.15	1.50
Oolobaria	GNU	200	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Opawa [1]	MRG	220	New Zealand Shipping Co., Ltd...	300, 600	P G ..	X	0.40	—
Ophir GYB [1]	GYB	200	Orient S.S. Co.	300, 600	P G ..	X	0.40	—
Orangeleaf [1]	ZZP	210	Lane & Macandrew, Ltd... ..	300, 600	P G ..	X	0.40	—
Orangemead [1]	YIL	145	Western Counties Shipping Co.,Ltd	300, 600	P G ..	X	0.40	—
Orange River [1]	ZEM	160	Brit. Empire S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Oranian [1]	ZGU	175	F. Leyland & Co., Ltd.	300, 600	P G ..	N	0.40	—
Orari [1]	MRM	240	New Zealand Shipping Co., Ltd...	300, 600	P G ..	X	0.40	—
Orator [1]	YNB	220	Charente S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Orbita [1]	MGI	240	Pacific S.N. Co.	300, 600, 2100[26], 2200[26]	P G ..	N	0.40	—
Orca [1]	MGO	240	Pacific S.N. Co.	300, 600	P G ..	N	0.40	—
Orcana [1]	MGF	200	Royal Mail S.P. Co.	300, 600	P G ..	N	0.40	—
Orcoma [1]	MJF	280	Pacific S.N. Co.	300, 600, 2100[26], 2200[26]	P G ..	N	0.40	—
Orduna [1]	MGP	280	Pacific S.N. Co.	300, 600, 2100[26], 2200[26]	P G ..	N	0.40	—
Oreland [1]	BAS	140	Hazlewood Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Orestes [1]	YTN	175	Ocean S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Oriana [1]	MJJ	230	Pacific S.N. Co.	300, 600, 2100[26], 2200[26]	P G ..	N	0.40	—
Orient City [1]	ZUN	150	St Just S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Oriflamme GDSV [1] ..	GDSV	400	Oriflamme S.S. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Orissa [1]	GNW	210	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Oristano [1]	ZFL	160	Gulf Line, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Orita [1]	MJG	230	Pacific S.N. Co.	300, 600, 2100[26], 2200[26]	P G ..	N	0.40	—
Orlando [1]	MID	250	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.15[21]	1.50[21]
Orlock Head [1]	GFDC	—	Ulster S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Ormara [1]	MVD	230	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Ormonde [1]	BNC	280	Orient S.N. Co., Ltd.	300, 600, 2100[26], 2200[26]	P G ..	0600 to 0800 0000 to 1200 1400 to 1800 2000 to 2200	0.40	—
Orna [1]	GNY	220	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Orontes [26]	MOZ	300	Orient S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Oropesa [8]	GDLP	300	Pacific S.N. Co.	300, 450, 600	P G ..	N	0.40	—
Orotava GUD [1] ..	GUD	220	Royal Mail S.P. Co.	300, 600	P G ..	N	0.40	—
Orowaiti [1]	GFMP	—	Union S.S. Co. of N.Z., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Orsova [1]	MOF	280	Orient S.N. Co., Ltd.	300, 600, 2100[26], 2200[26]	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Ortega [1]	MJK	220	Pacific S.N. Co.	300, **600**, 2100[26], 2200[26]	P G ..	N	0.40	—	
Orteric [1]	GBJW	—	Bank Line, Ltd...	300, **600**	P G ..	X	0.40	—	
Orthia	YYT	160	Donaldson Line, Ltd.	300, **600**	P G ..	N	0.40	—	
Ortinashell [1]	YLB	135	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Oruba MGJ [1]	MGJ	220	Royal Mail S.P. Co.	300, **600**	P G ..	N	0.40	—	
Orvieto [1]	MOJ	250	Orient S.N. Co., Ltd.	300, **600**, 2100[26], 2200[26]	P G ..	X	0.40	—	
Osiris [1]	GAQ	155	P. & O. S.N. Co.	300, **600**	P G ..	X	0.40	—	
Osterley [1] ..	MOY	250	Orient S.N. Co., Ltd.	300, **600**, 2100[26], 2200[26]	P G ..	X	0.40	—	
Oswestry [3]	GDYK	100	Dayton S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Otaki [1]	GCLN	—	New Zealand Shipping Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Otarama [1]	GTI	250	New Zealand Shipping Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Othello [1]	YNT	240	Ellerman's Wilson Line, Ltd. ..	300, **600**	P G	0900 to 1300 1500 to 1800 2000 to 2300	0.40	—	
Otira [1]	XFD	180	Shaw, Savill & Albion Co., Ltd...	300, **600**	P G ..	X	0.40	—	
Ottawa [1]	MIV	180	Anglo-American Oil Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Otterburn [1]	YBH	—	General Maritime Trust, Ltd. ..	300, **600**	P G ..	X	0.40	—	
Otto Kalthoff	GBYV	—	Andrew Crawford & Co.	300, **600**	P G ..	X	0.40	—	
Overdale [1]	BUY	145	Chr. Salvesen & Co.	300, **600**	P G ..	X	0.40	—	
Ovid [1]	GBTQ	—	Shakespear Shipping Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Oxfordshire [28]	MYE	300	Bibby S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Oxonian [1]	MHR	190	F. Leyland & Co., Ltd.	300, **600**	P G ..	N	0.40	—	
Oyleric [1]	YPE	190	Bank Line, Ltd.	300, **600**	P G ..	N	0.40	—	
Ozarda [1]	GNZ	140	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Pacific Transport [1] ..	ZED	145	Empire Transport Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Pacuare [1]	MLY	150	Elders & Fyffes, Ltd.	300, **600**	P G ..	X	0.40	—	
Padua [1]	GCVZ	—	P. & O. S.N. Co.	300, **600**	P G ..	X	0.40	—	
Pakeha [1]	GLG	250	Shaw, Savill & Albion Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Pak Ling [1]	ZJN	170	China Mutual S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Palermo [1]	MIL	180	P. & O. S.N. Co.	300, **600**	P G ..	X	0.40	—	
Palitana [1]	ZSQ	170	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Palma MKD [1]	MKD	170	P. & O. S.N. Co.	300, **600**	P G ..	X	0.40	—	
Palma YMG [1]	YMG	155	ritish & African S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Palmas (Las) [1] ..	GBVM	—	R. Mackill & Co.	300, **600**	P G ..	X	0.40	—	
Palm Branch [1] ..	EWG	175	Nautilus S.S. Co. Ltd.	300, **600**	P G ..	X	0.40	—	
Palmella [1]	GDNZ	—	Ellerman Lines, Ltd.	300, **600**	P G ..	X	0.40	—	

Paludina [1]	GFLM	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Panama MWB [1] ..	MWB	170	Pacific S.N. Co.	300, 600	P G ..	N	0.40	—
Panama Transport [1] ..	ZDV	160	Empire Transport Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Pancras [1]	MDI	155	Booth S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Pangani [1]	GBZN	150	Glen Line, Ltd.	300, 600	P G ..	X	0.40	—
Pangbourne OCL [1] ..	OCL	150	Power S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Pannonia [1]	MNA	250	Cunard S.S. Co., Ltd.	300, 600	P G ..	N	0.40	—
Paparoa [1]	MHY	230	New Zealand Shipping Co., Ltd...	300, 600	P G ..	X	0.40	—
Paraguayo (El) [1] ..	GCSP	250	Houlder Line, Ltd.	300, 600	P G ..	X	0.40	—
Parana [1]	GLK	150	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Pardo [1]	GLL	150	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Paris GLC [8]	GLC	120	L.B. & S.C. Railway Co.	300, 600	P G ..	N	0.15 [19]	1.50 [19]
Paris City [1]	GDRP	220	St. Just S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Parktown [1]	ZYF	150	Town Line (London), Ltd. ..	300, 600	P G ..	X	0.40	—
Parthenia [1]	ZXJ	170	Donaldson Line, Ltd	300, 600	P G ..	X	0.40	—
Partridge GDTS [1] ..	GDTS	—	G. & J. Burns, Ltd.	300, 600	P G ..	X	0.10 [20]	1.00 [20]
Pasha [1]	MZZ	200	Asiatic S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Patani [1]	ZIL	200	African S.S. Co.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Patella [1]	MZO	170	Anglo-Saxon Petro. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Pathan [1]	MPV	140	Mogul S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Patia [1]	GDCY	—	Elders & Fyffes, Ltd.	300, 600	P G ..	X	0.40	—
Patricia GBZP [1] ..	GBZP	—	Ellerman Lines, Ltd.	300, 600	P G ..	X	0.40	—
Patrician [1]	BDI	140	Charente S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Patriotic [1]	LSM	150	Belfast S.S. Co., Ltd.	300, 600	P G ..	X	0.05 [20]	0.50 [20]
Patrol MEM [3]	MEM	140	E. Extension Austr. & China **Tel.** Co., Ltd.	300, 600	P ..	X	0.40	—
Patuca [1]	GDB	200	Elders & Fyffes, Ltd.	300, 600	P G ..	X	0.40	—
Paul Paix [1]	YGP	145	Leonardo Carrying Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Pavia [1]	ZZV	170	Cunard S.S. Co., Ltd.	300, 600	P G ..	N	0.40	—
Pays de Waes [1] ..	GDXR	240	Lloyd Royal Belge (Gt. B.), **Ltd.**	300, 600	P G ..	X	0.40	—
Pear Branch [23] ..	GDZJ	350	Nautilus Steam Shipping Co., **Ltd.**	300, 450, 600	P G ..	X	0.40	—
Pearleaf [1]	ZZO	210	Lane & MacAndrew, Ltd. ..	300, 600	P G ..	X	0.40	—
Pearlmead [1]	YIM	—	Western Counties Shipping **Co.,** Ltd.	300, 600	P G ..	X	0.40	—
Peebles [1]	ODB	145	Sutherland S.S. Co., Ltd... ..	300, 600	P G ..	X	0.40	—
Peel Castle [1]	MVB	—	Isle of Man S.P. Co., Ltd. ..	300, 450, 600	P G ..	N	0.10 [20]	1.00 [20]
Peleus [1]	YPO	240	Ocean S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Pembroke [3]	BDT	—	Great Western Railway Co. ..	300, 600	P G ..	N	0.40	—
Pembrokeshire [1] ..	MUT	200	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Penare [1]	YFM	110	Penare S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Pencarrow [1]	GFQJ	—	R. B. Chellew S.N. Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Pencisely [1]	BNY	140	Hopkins, Sanders & Co.	300, 600	P G ..	X	0.40	—
Pendarves [1]	YHB	150	Pendarves S.S Co., Ltd.	300, 600	P G ..	X	0.40	—
Pendeen [1]	XFI	135	Pendeen S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Pendennis [1]	GBLS	120	Everett & Newbigin	300, 600	P G ..	X	0.40	—
Pendragon Castle [1] ..	ZZF	150	Lancashire Shipping Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Pengelly [1]	YLX	120	**Pencisely Shipping Co.**	300, 600	P G ..	X	0.40	—
Pengreep [1]	EWR	110	**Pengreep S.S. Co.**	300, 600	P G ..	X	0.40	—
Penmorvah [1]	ZXN	200	**Penmorvah S.S. Co.**	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs	
Penmount [1]	XFH	125	Penmount S.S. Co.	300, **600**	P G	X	0.40	—	
Pennard [1]	ZZC	150	Swansea Liners, Ltd.	300, **600**	P G	X	0.40	—	
Pennyworth [1]	ZPL	180	Dalgliesh S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Penpol [1]	GBLT	—	E. R. Newbigin	300, **600**	P G	X	0.40	—	
Penolver [1]	YXT	170	Penolver S.S. Co.	300, **600**	P G	X	0.40	—	
Penrhos [1]	YKW	145	Richard S.S. Co.	300, **600**	P G	X	0.40	—	
Penrhydd [1]	EXY	140	Ferrier & Rees	300, **600**	P G	X	0.40	—	
Penrhys [1]	MHX	—	Sidney Rees Nav. Co., Ltd.	300, **600**	P G	X	0.40	—	
Penrose [1]	ZWU	155	Penrose S.S. Co.	300, **600**	P G	X	0.40	—	
Pensacola OED [1]	OED	120	Furness, Withy & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Pensilva [1]	YMZ	140	Pensilva S.S. Co.	300, **600**	P G	X	0.40	—	
Pentaff [1]	GBYM	—	Pentaff S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Pentakota [1]	ZSN	170	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Pentaur	GOV	180	Chr. Salvesen & Co., of Leith	300, **600**	P G	X	0.40	—	
Penteifi [1]	GBXM	—	Pentwyn S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Perez [1]	BQZ	130	British Hispano Line, Ltd.	300, **600**	P G	X	0.40	—	
Perim [1]	GBKD	—	P. & O. S.N. Co.	300, **600**	P G	X	0.40	—	
Persian Prince [1]	XIZ	150	Prince Line, Ltd.	300, **600**	P G	X	0.40	—	
Persic [1]	MQC	250	Oceanic S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Perth [1]	EWC	130	Dundee, Perth & London Shipping Co.	300, **600**	P G	X	0.05 [20]	0.50 [20]	
Perthshire [5]	GQB	220	Scottish Shire Line, Ltd.	300, 450, **600**	P G	0900 to 1230 1300 to 1400 1600 to 1800 2000 to 0100	0.40	—	
Peru GLN [1]	GLN	220	Pacific S.N. Co.	300, **600**	P G	N	0.40	—	
Peshawar [1]	GCBS	165	P. & O. S.N. Co.	300, **600**	P G	X	0.40	—	
Peter Killen [1]	GDRJ	—	H. Ford, Esq.	300, **600**	P G	X	0.05 [20]	0.50 [20]	
Petersham [1]	ETZ	160	Britain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Peterton [1]	YGV	—	R. Chapman & Son	300, **600**	P G	X	0.40	—	
Petingaudet [1]	BFW	170	Boli[illegible]an Gen. Enterprise, Ltd.	300, **600**	P G	X	0.40	—	
Petricola [1]	GFLN	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Petrograd [1]	BUF	105	W. Thompson & Co.	300, **600**	P G	X	0.40	—	

Petroleine [1]	ZYK	160	Saxoline S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Potworth [1]	XIH	150	Power Co. S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Peveril [1]	XKK	150	C. A. Stewart & Co.	300, 600	P G	X	0.40	—
Phidias [1]	YOT	200	Liverpool, Brazil and River Plate S.N. Co., Ltd	300, 600	P G	X	0.40	—
Philadelphian [1]	GCMJ	—	F. Leyland & Co., Ltd.	300, 600	P G	X	0.40	—
Phoebe [1]	OCN	140	Bede S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Phorus [1]	YCY	160	Anglo-Saxon Petroleum Co., Ltd.	300, 600	P G	X	0.40	—
Phrygia [1]	EST	170	Cunard S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Physa [1]	EVW	190	Anglo-Saxon Petro. Co., Ltd.	300, 600	P G	X	0.40	—
Pecton [1]	YFA	—	E. T. Radcliffe & Co.	300, 600	P G	X	0.40	—
Piako [1]	GBYP	—	New Zealand Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Pikepool [1]	YLV	140	Pool S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Pilar de Larrinaga [1]	BHF	—	Miguel de Larrinaga S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Pilton [1]	GDBP	135	Lord Glanely	300, 600	P G	X	0.40	—
Pinar del Rio [1]	GCNJ	—	Santa Clara S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Pinemoor [1]	ZJO	135	Johnston Line, Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Pinewin [1]	GBX	150	**Ashwin & Co.**	300, 600	P G	X	0.40	—
Pinot [1]	GBTV	—	James McKelvie & Co.	300, 600	P G	X	0.40	—
Pittsburgh GFJS [1]	GFJS	—	International Navigation Co., Ltd.	300, 450, 600	P G	N	0.40	—
Pladda [1]	GFMB	—	Clyde Shipping Co., Ltd.	300, 450, 600	P G	X	0.10[20]	1.00[20]
Planorbis [1]	GFLP	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, 600	P G	X	0.40	—
Plassy [1]	MNJ	250	P. & O. S.N. Co., Ltd.	300, 600	P G	N	0.40	—
Plata (La) GBKF [1]	GBKF	—	Ellerman's Wilson Line, Ltd.	300, 600	P G	X	0.10	—
Pleiodon [1]	GFLQ	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, 600	P G	X	0.40	—
Plum Branch [23]	GBJL	350	Nautilus Steam Shipping Co., Ltd.	300, 450, 600	P G	X	0.40	—
Plumleaf [1]	ZZM	210	**Lane & MacAndrew, Ltd.**	300, 600	P G	X	0.40	—
Plutarch [1]	ZIB	155	**L'pool Brazil & River Plate S.N. Co., Ltd.**	300, 600	P G	X	0.40	—
Pointer [1]	GDTR	130	G. & J. Burns, Ltd.	300, 600	P G	X	0.10[20]	1.00[20]
Poland [1]	ZWZ	250	Atlantic Transport Co., Ltd.	300, 600	P G	N	0.40	—
Polbain [1]	BLH	170	**Coast Lines, Ltd.**	300, 600	P G	X	0.40	—
Polcrest [1]	BOH	135	**L. Lougher & Co.**	300, 600	P G	X	0.40	—
Poldennis [1]	BFY	—	**Fisher, Alimonda & Co., Ltd.**	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Poleric [1]	GCY	210	A. Weir & Co.	300, 600	P G	N	0.40	—
Polglass Castle [1]	ZTA	160	Union-Castle Mail S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Polgowan	ZIZ	—	Farrer Groves & Co., Ltd.	300, 600	—	X	—	—
Polish Monarch [1]	EJC	145	Raeburn & Verel, Ltd.	300, 600	P G	X	0.40	—
Politician [1]	MVZ	155	Charente S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Polladern [1]	ZMH	220	J. Herron & Co.	300, 600	P G	X	0.40	—
Pollensa [1]	XHS	145	J. Cory & Sons, Ltd.	300, 600	P G	X	0.40	—
Polo [1]	GBNJ	125	Ellerman's Wilson Lines, Ltd.	300, 600	P G	X	0.40	—
Polperro [1]	BFZ	150	Fisher Alimonda & Co.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2220	0.40	—
Polshannon [1]	XUK	230	**Anglo-Saxon Petro. Co., Ltd.**	300, 600	P G	X	0.40	—
Poltolia [1]	ZWA	—	**Anning Bros.**	300, 600	P G	X	0.40	—
Polycarp [1]	XIE	140	**Booth S.S. Co., Ltd.**	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per R dio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Polyphemus[1]	YSZ	170	China Mutual S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Pomaron[1]	OEI	125	Furness, Withy & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Poona[1]	MSO	190	P. & O. S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Poplar Branch[1]	YPF	160	Nautilus S. Shipping Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Porsanger[1]	YBW		Furness Withy & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	—	—	
Portfield[1]	GCBF	170	W. E. Hinde & Co.	300, **600**	P G	X	0.40	—	
Port Adelaide[1]	GCNR	220	Commonwealth & Dominion Line, Ltd.	300, **600**	P G	X	0.40	—	
Port Albany[2]	**GWI**	250	Commonwealth & Dominion Line, Ltd.	300, 450, **600**	P G	X	0.40	—	
Port Alma[1]	**EQB**	180	Commonwealth & Dominion Line, Ltd.	300, **600**	P G	X	0.40	—	
Port Augusta[1]	**EPN**	150	Commonwealth & Dominion Line, Ltd.	300, **600**	P G	X	0.40	—	
Port Bowen[1]	**XHP**	210	Commonwealth & Dominion Line, Ltd.	300, **600**	P G	X	0.40	—	
Port Caroline[1]	**XHQ**	220	Commonwealth & Dominion Line, Ltd.	300 **600**	P G	X	0.40	—	
Port Chalmers[1]	**EJW**	220	Commonwealth & Dominion Line, Ltd.	300, **600**	P G	X	0.40	—	
Port Curtis[1]	GCFJ	—	Commonwealth & Dominion Line, Ltd.	300, **600**	P G	X	0.40	—	
Port Darwin[1]	**YGL**	150	Commonwealth & Dominion Line, Ltd.	300, **600**	P G	X	0.40	—	
Port Denison[1]	**YGM**	150	Commonwealth & Dominion Line, Ltd.	300, **600**	P G	X	0.40	—	
Port Elliot[1]	**ZLT**	155	Commonwealth & Dominion Line, Ltd.	300, **600**	P G	X	0.40	—	
Portfield[1]	GCBF	170	W. E. Hinde & Co.	300, **600**	P G	X	0.40	—	
Portgwarra	BLP	—	Portfield S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	

Port Hacking [1]	EIP	200	Commonwealth & Dominion Line, Ltd.	300, 600	P G	X	0.40	—
Porthia [1]	GDLM	200	Robert Sawle Read, Esq.	300, 450, 600	P G	X	0.40	—
Portinglis [1]	MXN	—	Furness, Withy & Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Port Kembla [1]	GCNQ	—	Commonwealth & Dominion Line, Ltd.	300, 600	P G	X	0.40	—
Port Lincoln [2]	GTZ	260	Commonwealth & Dominion Line, Ltd.	300, 600	P G	N	0.40	—
Portloe [1]	EKN	145	W. E. Hinde & Co.	300, 600	P G	X	0.40	—
Port Lyttelton [1]	ZPD	200	Commonwealth & Dominion Line, Ltd.	300, 600	P G	X	0.40	—
Port Macquarrie [2]	GSB	260	Commonwealth & Dominion Line, Ltd.	300, 600	P G	N	0.40	—
Port Melbourne [1]	ZSW	210	Commonwealth & Dominion Line, Ltd.	300, 600	P G	X	0.40	—
Port Napier [1]	ZNZ	180	Commonwealth & Dominion Line, Ltd.	300, 600	P G	X	0.40	—
Port Nicholson [1]	XHO	200	Commonwealth & Dominion Line, Ltd.	300, 600	P G	X	0.40	—
Port Phillip [1]	EPO	160	Commonwealth & Dominion Line, Ltd.	300, 600	P G	X	0.40	—
Port Pirie [1]	ZSV	200	Commonwealth & Dominion Line, Ltd.	300, 600	P G	X	—	—
Portreath [1]	MXX	140	Portloe S.S. Co.	300, 600	P G	X	0.40	—
Portrushton [1]	YPW	145	Portland S.S. Co., Ltd.	300, 600	P G	X	—	—
Portsea [1]	YQH	135	Sea S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Port Stephens [1]	ZSU	230	Commonwealth & Dominion Line, Ltd.	300, 600	P G	X	—	—
Port Sydney [1]	ZLU	220	Commonwealth & Dominion Line, Ltd.	300, 600	P G	N	0.40	—
Portuguese Prince [1]	GRS	200	Prince Line, Ltd.	300, 600	P G	N	0.40	—
Port Victor [1]	EQD	250	Commonwealth & Dominion Line, Ltd.	300, 600	P G	X	0.40	—
Portwood [1]	GFCK	150	Wm. France, Fenwick & Co., Ltd.	300, 600	P G	X	0.15[21]	1.50[21]
Port	GBTN	—	Lamport & Holt	300, 600	P G	X	0.40	—
Potomac GLQ [1]	GLQ	145	Anglo American Oil Co., Ltd.	300, 600	P G	X	0.40	—
Potosi [1]	MII	170	Pacific S.N. Co., Ltd.	300, 600	P G	0900 to 1100 2000 to 0200	0.40	—
Prah [1]	ERW	220	Brit. & African S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Prahsu [1]	ZMB	200	African S.S. Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Prairial [1]	BAM	155	Plesson S.N. Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Pretoria GCYB [1]	GCYB	—	—	300, 600	P G	X	0.40	—
Pretorian [1]	MFN	200	Allen Line S.S. Co., Ltd.	300, 600	P G	N	0.40	—
Priam [1]	YTO	200	Ocean S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Priestfield [1]	BDQ	—	A. M. Sutherland	300, 600	P G	X	0.40	—
Prince George GLR [3, 17]	GLR	150	Grand Trunk Pacific Development Co., Ltd.	300, 600	P G	N	0.40	4.00

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Prince Rupert [2]	GLS	150	Grand Trunk Pacific Development Co., Ltd.	300, **600**	P G	N	0.40	4.00	
Princesa [1]	ZQE	150	Furness-Houlder Argentine Line, Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Princess	BJX	—	Ellerman & Bucknall S.S. Co., Ltd.	300, **600**	—	X	—	—	
Princess Ena GDQX [1]	GDQX	—	London & S. Western Rly. Co.	300, **600**	P G	N	0.10[19]	1.00[19]	
Princess Maud [3]	YXR	—	Portpatrick & Wigtownshire Railway Joint Comm.	300, **600**	P G	X	0.40	—	
Princess Victoria MCM [1]	MCM	250	Canadian Pacific Railway Co.	300, **600**	P G	N	0.40	4.00	
Princess Victoria ZTF [1]	ZTF	—	Portpatrick & Wigtownshire Railway Joint Comm.	300, **600**	P G	X	0.40	—	
Prinses Juliana YRY	YRY	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Prinzessin [1]	GBDT	—	Shaw, Savill & Albion Co., Ltd.	300, **600**	P G	X	0.40	—	
Prinz Friedrich Wilhelm	GCNV	—	White Star Line	300, **600**	P G	X	0.40	—	
Prinz Hubertus [1]	GBMK	—	P. & O. S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Prinz Ludwig [1]	GBKL	—	P. & O. S.N. Co., Ltd.	300, **600**	P G	X	—	—	
Produgol [1]	GDSR	—	C. Doresa & Co.	300, **600**	P G	X	0.40	—	
Professor EMS [1]	EMS	160	Charente S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Professor BRY [1]	BRY	250	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	—	—	
Prometheus YTA [1]	YTA	180	Ocean S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Promus [1]	OCZ	150	Tempus Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Protesilaus [7]	GSC	250	China Mutual S.N. Co., Ltd.	300, 450, **600**	P G	X	0.40	0.40	
Pruth [1]	EUU	145	Mercantile S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Prygona [1]	EQF	—	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Puma [1]	GDTV	—	G. & J. Burns, Ltd.	300, **600**	P G	X	0.10[28]	1.00[28]	
Pundit [1]	OCO	—	Asiatic S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Pundua [1]	ZSP	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Pungo [1]	GBKV	—	Turner Brightman & Co.	300, **600**	P G	X	0.40	—	
Purnea [1]	BSQ	225	British India S.N. Co., Ltd.	300, **600**	P G	X	—	—	
Putney [1]	YKQ	135	Britain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Pyrrhus [1]	YOY	220	Ocean S.S. Co.	300, **600**	P G	X	0.40	—	
Pyrula [1]	EZH	185	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Quantock [1]	ZJF	—	Mediterranean Cargo Steamers	300, **600**	P G	X	0.40	—	
Quebec City [1]	GBNX	—	St. Just S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Queda [1]	GOA	200	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Queen Alexandra [1]	ELN	130	Ambleforth S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	

Ship	Call sign		Owner				Hours		
Queen Louise [1]	BUW	170	Dunlop S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Queen Margaret [1]	ZRW	160	Dunlop S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Queenmead [1]	EQL	—	Western Counties Shipping Co., Ltd.	300, 450, 600	P G	..	X	0.40	—
Queensland [1]	EJE	175	R. M. Hudson & Sons	300, 600	P G	..	X	0.40	—
Queensland Transport [1]	ZEA	190	Empire Transport Co., Ltd.	300, 600	P G	..	X	0.40	—
Quentin [1]	ZOV	120	G. Gibson & Co., Ltd.	300, 600	P G	..	X	0.05 [20]	0.50 [20]
Querimba [1]	GOB	200	British India S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Quillota [1]	MWK	200	Pacific S.N. Co., Ltd.	300, 600	P G	..	N	0.40	—
Quiloa [1]	GOC	200	British India S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Quilpue [1]	GLT	200	Pacific S.N. Co., Ltd.	300, 600	P G	..	N	0.40	—
Quito [1]	ZWF	150	Deane Shipping Co., Ltd.	300, 600	P G	..	X	0.40	—
Rabymere [1]	EVC	140	Bromport S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Radix [1]	GFLK	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, 600	P G	..	X	0.40	—
Radnorshire [1]	GBQX	190	Royal Mail Steam Packet Co., Ltd.	300, 600	P G	..	N	0.40	—
Raeburn [1]	MES	190	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Raithwaite [1]	MNX	140	Leslie Shipping Co.	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Rajah XKP [1]	XKP	200	Asiatic S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Rajput [1]	XMU	200	Asiatic S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Ramon de Larrinaga [1]	GCZP	—	Miguel de Larrinaga S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Ramore Head [1]	YSG	200	Ulster S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Ramos [3]	GLU	140	Amazon Telegraph Co., Ltd.	300, 600	P	..	—	—	—
Ranee [1]	XKO	200	Asiatic S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Ranella [1]	MZP	190	Anglo-Saxon Petro. Co., Ltd.	300, 600	P G	..	X	0.40	—
Ranger MLD [3]	MLD	150	Liverpool Salvage Association	300, 600	P	..	X	0.10 [20]	1.00 [20]
Raphael [1]	MET	175	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Rapidan EQV [1]	EQV	180	Furness, Withy & Co., Ltd.	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Raranga [1]	ZNI	200	Shaw, Savill & Albion Co., Ltd.	300, 600	P G	..	X	0.40	—
Rassay [1]	MGR	140	Isles S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Rathlin [1]	GFMC	—	Clyde Shipping Co., Ltd.	300, 450, 600	P G	..	X	0.10 [20]	1.00 [20]
Rathlin Head [1]	ZAR	150	Ulster S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Rathmore [3]	GUT	250	L. & N.W. Railway Co.	300, 600	P G	..	N	0.05 [20]	0.50 [20]
Ravelston [1]	YGY	135	Ravelston S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Ravenrock [1]	GCSY	135	Glover Bros.	300, 600	P G	..	X	0.40	—
Ravenshoe [1]	YAT	160	Seville & U.K. Carrying Co., Ltd.	300, 600	P G	..	X	0.40	—
Ravenspoint [1]	XFF	135	Sir J. Esplen & Co.	300, 600	P G	..	X	0.40	—
Ravenstone [1]	BRZ	145	Chr. Salvesen & Co.	300, 600	P G	..	X	0.40	—
Ravenswood [1]	GFNR	—	P. & A. Campbell, Ltd.	300, 450, 600	P G	..	X	0.10 [20]	1.00 [20]
Ravensworth [1]	GBJN	170	Dalgliesh S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Reading [1]	EXK	145	Seville & U.K. Carrying Co., Ltd.	300, 600	P G	..	X	0.40	—
Recorder [3]	MEJ	140	E. Extension Australian & China Tel. Co., Ltd.	300, 600	P	..	X	0.40	—
Redbridge [1]	YHQ	155	Temperley S.S. Co., Ltd.	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Red Cap [1]	ZRG	130	Red Cap S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per-Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Redgate [1]	ZTL	—	Redgate S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Redruth [1]	**XMC**	150	**Redruth S.S. Co., Ltd.**	300, **600**	P G	X	0.40	—	
Rees Llewellyn [1]	EUB	—	R. W. J. Sutherland & Co.	300, **600**	P G	X	0.40	—	
Refloater [3]	GBVF	—	Maritime Salvors, Ltd.	300, **600**	P	X	—	—	
Regent [1]	**EZQ**	145	J. Westoll	300, **600**	P G	X	0.40	—	
Regina GBCT [1]	**GBCT**	160	J. & A. Roxburgh	300, **600**	P G	X	0.40	—	
Regina ZOD [1]	**ZOD**	—	**British & North Atlantic S.N. Co., Ltd.**	300, **600**	P G	X	0.40	—	
Reindeer MSD [3]	**MSD**	120	Great Western Railway Co.	300, **600**	P G	N	0.40	—	
Reindeer ZRN [1]	**ZRN**	—	Jackson Bros. & Cory	300, **600**	P G	X	0.40	—	
Relentless XHN [1]	**XHN**	110	Penmark Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Reliant [3]	GCYX	—	Maritime Salvors, Ltd.	300, **600**	P	X	—	—	
Relillio [1]	**XLZ**	140	Orders & Hanford S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rembrandt MEU [1]	**MEU**	160	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Remuera [1]	**MKV**	250	New Zealand S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Reresby [1]	**MMC**	145	Birkdale S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Restorer GCVY [3]	GCVY	—	Maritime Salvors, Ltd.	300, **600**	P	X	—	—	
Retriever GDVT [3]	GDVT	—	West Coast of Am. Tel. Co., Ltd.	300, **600**	P G	X	0.40	—	
Reval BEB [1]	**BEB**	120	W. Thomson & Co.	300, **600**	P G	X	0.40	—	
Reventazan [1]	GDCV	—	Elders & Fyffes, Ltd.	300, **600**	P G	X	0.40	—	
Rexmore [1]	**XHY**	150	Johnston Line, Ltd.	300, **600**	P G	X	0.40	—	
Rheinfels [1]	**YDH**	—	Grahams & Co.	300, **600**	P G	X	0.40	—	
Rhenania [1]	**GBMC**	—	Turnbull Scott Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Rhesus [1]	**ZII**	250	China Mutual S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rhio [1]	**YHW**	135	Orders & Handford S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rhode Island BUX [1]	**BUX**	150	White Diamond S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rhodesian Transport [1]	**ZGB**	160	Empire Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
Rialto [1]	GBNS	—	Ellerman & Bucknall S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Ribera [1]	GFLV	—	Bolton Steam Shipping Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Richard Welford [28]	GBTX	100	Tyne-Tees Steam Shipping Co., Ltd.	300, **600**	P G	X	0.10[28]	1.00[20]	
Ridley [1]	**BGL**	150	Red "R" S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rimouski [1]	**GIZ**	230	British & North Atlantic S.N. Co., Ltd.	300, **600**	P G	N	0.40	—	
Rimutaka [1]	**MBT**	230	**New Zealand Shipping Co., Ltd.**	300, **600**	P G	X	0.40	—	
Ringdove [1]	GFJR	—	Falmouth Docks Co.	300, 450, **600**	P G	X	0.10[20]	1.00[20]	
Rion [1]	**XJI**	140	**Petroleum S.S. Co., Ltd.**	300, **600**	P G	X	0.40	—	
Rio Blanco [1]	**YXN**	170	Thompson S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rio Negro BGK	BGK	—	Houlder Bros.	300, **600**	P G	X	0.40		

Rio Preto[1]	BAW	160	London American Maritime Trading Co., Ltd.	300, 600	P G	X	0.40	—
Ripley Castle[1]	BBW	—	Union Castle Mail S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Riposto[1]	GCNK	140	J. Glynn & Sons	300, 600	P G	X	0.40	—
Risaldar[1]	MTE	180	Asiatic S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Rishon[1]	GBVS	110	English & Overseas Trading & Industrial Co., Ltd.	300, 600	P G	X	0.40	—
River Araxes[13]	ZIT	—	America Levant Line, Ltd.	300, 600	—	—	—	—
Riverdale[1]	YMX	150	Plisson S.N. Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
River Dare[1]	GCMQ	—	D. R. Llewellyn, Merrett & Price, Ltd.	300, 600	P G	X	0.40	—
River Dart[1]	XJA	—	D. R. Llewellyn, Merrett & Price, Ltd.	300, 600	P G	X	0.40	—
River Orontes[1]	EVD	150	America Levant Line, Ltd.	300, 600	P G	X	0.40	—
River Taff[1]	YIII	—	D. R. Llewellyn, Merrett & Price, Ltd.	300, 600	P G	X	0.40	—
Riverton[1]	BNE	120	Charlton S.S. Co., Ltd.	300, 600	P G	X	0.40	—
River Trent[1]	MCX	—	D. R. Llewellyn, Merrett & Price, Ltd.	300, 600	P G	X	0.40	—
River Wye[1]	BFP	—	D. R. Llewellyn, Merrett & Price, Ltd.	300, 600	P G	X	0.40	—
Riviera[1]	GUO	50	S.E. & Chatham Railway Co.'s Mng. Comm.	300, 600	P G	N	0.40	—
Roath[1]	ZRJ	170	British S. Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Robert Dollar[1]	GFMN	—	Robert Dollar S.S. Co.	300, 450, 600	P G	X	0.40	—
Rochdale[1]	BGU	145	Rochdale S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Rochelie	GDJB	100	Sugar Products Co. (New York)	300, 450, 600	P G	X	0.40	—
Rocio[1]	ENC	175	Orders & Handford S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Roker[1]	BSO	150	J. Westoll	300, 600	P G	X	0.40	—
Rollo[1]	ZLR	—	Ellerman's Wilson Line, Ltd.	300, 600	P G	X	0.15[21]	1.50[21]
Roma ESW[1]	ESW	170	Rowland Marwood S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Roma GBMW[1]	GBMW	—	O. & W. Williams	300, 600	P G	X	0.40	—
Roman Prince[1]	ZGI	120	Prince Line, Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Romanstar[1]	MRO	190	Union Cold Storage Co., Ltd.	300, 600	P G	X	0.40	—
Romeo[1]	ZOP	220	Hall Line Ltd	300, 600	P G	X	0.40	—
Romera[13]	YVI	—	Glasgow United Shipping Co., Ltd.	—	—	—	—	—
Romney MEV	MEV	170	Liverpool, Brazil and River Plate S.N. Co., Ltd	300, 600	P G	X	0.40	—
Romney YKP[1]	YKP	—	Franco-British S.S. Co.	300, 600	P G	X	0.40	—
Roualee[1]	GCLS	—	Universal S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Rona[1]	VXQ	—	Colonial Sugar Refining Co., Ltd.	—	—	—	—	—
Ronan[1]	BQE	145	G. Gibson & Co., Ltd.	300, 600	P G	X	0.05[20]	0.50[20]
Ronda[1]	GDQK	—	Bowring S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Rondo OCS[1]	OCS	130	Pelton S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Rooke	GAG	130	F. C. Strick & Co., Ltd.	300, 600	P G	X	0.40	—
Roon[1]	GCWD	—	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Roquelle[1]	XMV	150	Elder Dempster & Co., Ltd.	300, 600	P G	X	0.40	—
Rosalind ZFA[1]	ZFA	150	New York, Newfoundland & Halifax S.S. Co., Ltd.	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Rosarina (La) [1]	GJW	250	Brit. & Argentine S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rose [1]	MTO	135	Laird Line, Ltd.	300, **600**	P G	X	0.40	—	
Rose Castle [1]	YWV	170	Lewis S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Roseden [1]	YGE	120	Stephens, Sutton & Stephens	300, **600**	P G	X	0.40	—	
Rosefield [1]	BND	135	Woodfield S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Roseric [1]	GLY	250	A. Weir & Co.	300, **600**	P G	N	0.40	—	
Roseworth [1]	GCZX	—	Robert Stanley Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Rossano [1]	ZFM	200	Gulf Line, Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Rossetti [1]	MEY	175	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rossia YDI [1]	YDI	180	Sefton S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rosstrevor [1]	YWB	135	L. & N.W. Railway Co.	300, **600**	P G	N	0.05[20]	0.50[20]	
Rosyth Castle [1]	XXB	—	Union Castle Mail S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rotenfels [1]	EQY	—	Grahams & Co.	300, **600**	P G	X	0.40	—	
Rotherhill [3]	GDXW	100	Llewellyn Shipping Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Rothley [1]	EPE	125	Red "R" S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rotterdam ZOS [1]	ZOS	120	Rankine Line, Ltd.	300, **600**	P G	X	0.05[20]	0.05[20]	
Rouen XEI [1]	XEI	130	Furness, Withy & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Roulers [3]	GPL	130	Great Eastern Railway Co.	300, 450, **600**[23]	P G	N	0.40	—	
Roumelian [1]	ZPG	145	Ellerman Lines, Ltd.	300, **600**	P G	X	0.40	—	
Rounton [1]	XFJ	130	Hansen S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Rounton Grange [1]	ZER	140	Houlder Line, Ltd.	300, **600**	P G	X	0.40	—	
Rowan GDVB [1]	GDVB	—	Laird Line, Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
Rowanpark [1]	GFCR	175	Denholm Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Roxmead [1]	EJH	160	Western Counties Shipping Co.,	300, **600**	P G	X	0.40	—	
Royal City [1]	GBMF	—	St. Just S.S. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Royal George ZRY [1]	ZRY	—	Cunard S.S. Co., Ltd.	300, **600**, 2200[20]	P G	N	0.40	—	
Royal Prince [1]	YJI	160	Prince Line, Ltd.	300, **600**	P G	X	0.40	—	
Royal Sceptre [1]	BFR	140	Thompson S. Shpg. Co., Ltd.	300, **600**	P G	X	0.40	—	
Royal Scot	ZTJ	—	London & Edinburgh Shipping Co.	300, **600**	P G	—	0.05[20]	0.50[20]	
Royalster [1]	ZRZ	150	Royal Star Line, Ltd.	300, **600**	P G	X	0.40	—	
Royal Transport	ZAB	—	Empire Transport Co., Ltd.	—	—	—	—	—	
Royston Grange [1]	GLZ	150	Houlder Bros. & Co., Ltd.	300, **600**	P G	X	0.40	—	

Ruahine [1]	MKA	200	New Zealand Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Ruapehu [1]	MKB	250	New Zealand Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Rubens [1]	GBCY	—	Belton Steam Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Rudelsburg [1]	GBJQ	—	Bank Line, Ltd.	300, 600	P G ..	X	0.40	—
Rugia [1]	GBTL	—	A. Holt & Co., Ltd.	300, 600	P G ..	X	0.40	—
Runic [1]	MWC	250	Oceanic S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Runo [1]	GDNW	125	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.40	—
Rumney [1]	EPJ	135	Rumney S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Ruthenia [3]	GDYL	80	Admiralty	300, 600	P ..	—	—	—
Ryburn [1]	XHX	145	Chas. Lowe & Partners, Ltd. ..	300, 600	P G ..	X	0.40	—
Ryckett [1]	EIA	—	London Transport Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Ryde [1]	BSN	170	Rowland & Marwood S.S. Co., Ltd	300, 600	P G ..	X	0.40	—
Sabor [1]	GBQW	—	Royal Mail S.P. Co.	300, 600	P G ..	N	0.40	—
Sachem MOL [1]	MOL	175	—	300, 600	P G ..	X	0.40	—
Sagama River [1] ..	ZEK	160	British Empire S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Sagua LTP [1]	LTP	180	Tres, Ltd.	300 600	P G ..	X	0.40	—
Sakkarah [1]	GBSN	—	Bell Symondson & Co.	300, 600	P G ..	X	0.40	—
Salacia [1]	YIV	—	Donaldson Line, Ltd.	300, 600	P G ..	X	0.40	—
Salaga [1]	ZMU	160	Imperial Direct Line, Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Salerno EUR [1]	EUR	170	Gulf Line, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Salient [1]	EKR	140	J. Westoll	300, 600	P G ..	X	0.40	—
Sallust [1]	ZQH	155	L'pool Brazil & River Plate S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Saltees [1]	GFMD	—	Clyde Shipping Co., Ltd. ..	300, 450, 600	P G ..	X	0.10[20]	1.00[20]
Salvador ZBV [1] ..	ZBV	130	Pacific S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Sambre [1]	GCDV	—	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Sampan [3]	EQN	—	Denaby & Cadeby Main Collieries, Ltd.	300, 600	P G ..	X	0.40	—
Sanday [1]	ZRM	—	Isles S. Shpg. Co., Ltd.	300, 600	P G ..	X	0.40	—
Sandon Hall [1]	GDPY	—	Hall Line, Ltd.	300, 600	P G ..	X	0.40	—
Sandown Castle [1] ..	GFBW	—	Union Castle Mail S.S. Co., Ltd...	300, 600	P G ..	X	0.40	—
Sangola [1]	GOD	175	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Santeramo [1]	ZGH	—	Gulf Line, Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Santhia [1]	GOE	175	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Sapele [1]	YME	—	British & African S.N. Co., Ltd...	300, 600	P G ..	X	0.40	—
Sapphire [6]	MHK	200	Duke of Bedford	300, 600	P ..	X	—	—
Sarah Jolliffe [1]	ZAU	—	Alexandra Towing Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Saranac EYG [1] ..	EYG	145	Anglo-American Oil Co.	300, 600	P G ..	X	0.40	—
Sardinia GMB [1] ..	GMB	220	P. & O. S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Sardinian [1]	MDN	200	Allen Line	300, 600	P G ..	N	0.40	—
Sarthe [1]	GCDW	—	Royal Mail S.P. Co.	300, 600	P G ..	N	0.40	—
Satanta [2]	GTG	125	Standard Transportation Co., Ltd.	300, 600	P ..	X	—	—
Saturnia [1]	MBF	250	Donaldson Line, Ltd.	300, 600, 2100[26], 2200[26]	P G ..	N	0.40	—
Sauerland [1]	GDKY	—	Furness, Withy & Co.	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Sausenburg [1]	GBNF	—	Donaldson Bros., Ltd.	300, **600**	P G	X	0.40	—	
Saxicava [1]	GFLD	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Saxilby [1]	ELW	145	Sir R. Ropner & Co., Ltd.	300, **600**	P G	X	0.40	—	
Saxoleine [1]	LTX	150	Saxoline S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Saxon MQI [1]	MQI	200	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Saxonia [1]	MSA	230	Cunard S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Saxonstar [2]	YVY	250	Union Cold Storage Co., Ltd.	300, **600**	P G	X	0.40	—	
Scaldier [1]	EXI	140	Lloyd Royal Belge (Gt. Britain), Ltd.	300, **600**	P G	X	0.40	—	
Scalfaria [1]	GFKZ	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Scandia [1]	YUN	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Scandinavian [1]	MNC	—	Allan Line S.S. Co.	300, **600**	P G	N	0.40	—	
Scarpa [1]	BUI	145	Isles S. Shpg. Co.	300, **600**	P G	X	0.40	—	
Scatwell [1]	YEQ	140	Tempus S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Schwarzenfelde [1]	GBVL	—	Gow, Harrison & Co.	300, **600**	P G	X	0.40	—	
Schwaben [1]	GBQL	—	F. C. Strick & Co.	300, **600**	P G	X	0.40	—	
Schwarzenfels [1]	GBKZ	—	Macvicar Marshall & Co., Ltd.	300, **600**	P G	X	0.40	—	
Schwinge [1]	GBKX	—	James Gardiner & Co.	300, **600**	P G	X	0.40	—	
Scientist [1]	GXD	—	Charente Steamship Co., Ltd.	300, **600**	P G	X	0.40	—	
Scindia [1]	MHJ	175	Henderson Bros. (Anchor Line)	300, **600**	P G	X	0.40	—	
Scipio [1]	ODR	115	Ellerman's Wilson Line, Ltd.	300, **600**	P G	X	0.40	—	
Scotia GBJZ [1]	GBJZ	—	Hall Bros.	300, **600**	P G	X	0.40	—	
Scotia GDRW [3]	GDRW	—	L. & N.W. Railway Co.	300, **600**	P G	N	0.05[20]	0.50[20]	
Scotian [1]	MJN	200	Allan Line S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Scottier [1]	ZRR	155	Lloyd Royal Belge (Gt. Britain), Ltd.	300, **600**	P G	X	0.40	—	
Scottish American [1]	GDSM	—	Tankers, Ltd.	300, **600**	P G	X	0.40	—	
Scottish Bard [1]	BOR	150	Tankers, Ltd.	300, **600**	P G	X	0.40	—	
Scottish Monarch [1]	ERS	180	Monarch S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Scottish Prince [1]	YXV	145	Prince Line, Ltd.	300, **600**,	P G	N	0.40	—	
Scythia [25]	GDYP	350	Cunard S.S. Co., Ltd.	300, 450, **600**, 2100[26], 2200[26]	P G	N	0.40	—	
Scythian [1]	ZGW	155	F. Leyland & Co., Ltd.	300, **600**	P G	N	0.40	—	
Seabank [1]	BUW	140	Kestell S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Sea Glory [1]	ZYG	125	Dover Nav. Co., Ltd.	300, **600**	P G	X	0.40	—	
Seaham Harbour [3]	GDXQ	100	David Nicholson Grimes	300, **600**	P G	X	0.10[20]	1.00[20]	
Sealda [1]	GOF	200	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Seamew [3]	LSE	—	General S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Seapool [1]	ZWC	160	Pool S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	

Sea Serpent [1]	ZIH	115	Leach & Co., Ltd.	300, **600**	P G ..	X	0.40	—
Seatonia [1]	BUU	150	Hartlepool Seatonia S.S. Co. ..	300, **600**	P G ..	X	0.40	—
Seattle ZJA [1]	ZJA	—	G. Heyn & Sons	300, **600**	—	X	—	—
Sea Victory	GCTW	125	Dover Navigation Co., Ltd. ..	300, 450, **600**	P G	X	0.40	—
Sedgepool [1]	XEW	120	Pool S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Sellasia [1]	ZIR	—	Chr. Salvesen & Co.	300, **600**	P G ..	X	0.40	—
Seminole GFML [1] ..	GFML	—	Anglo-American Oil Co., Ltd...	300, 450, **600**	P G ..	X	0.40	—
Semper Paratus [1] ..	GFMQ	—	Cecil Finlay Read, Esq...	300, 450, **600**	P G ..	X	0.40	—
Senator EPM [1] ..	EPM	170	Charente S.S. Co., ...	300, **600**	P G ..	X	0.40	—
Sentinel II. [3]	MFB	140	Eastern Telegraph Co.	300, 450, **600**	P ..	X	0.40	—
Serbino [1]	XII	170	Hall Line, Ltd.	300, **600**	P G ..	X	0.40	—
Serbistan [1]	GCYD	140	Strick Line, Ltd.	300, **600**	P G ..	X	0.40	—
Servian Prince [1] ..	YTR	150	Prince Line, Ltd.	300, **600**	P G ..	N	0.40	
Sesostris [1]	GBVD	—	R. Gordon & Co.	300, **600**	P G ..	X	0.40	—
Settler [1]	YAF	—	Charente Steamship Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Severn [1]	GBQT	170	Royal Mail Steam Packet Co. ..	300, **600**	P G ..	N	0.40	—
Severnmede [1]	ELT	—	Brand-Adams S.S. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Shadwell [8]	YVK	—	T. & J. Brocklebank, Ltd. ..	300, 450, **600**	P G ..	X	0.40	—
Shahjehan [1]	GDVS	—	Asiatic S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Shahristan [1]	GCDK	140	Strick Line, Ltd.	300, **600**	P G ..	X	0.40	—
Shahzada [1]	GDVQ	—	Asiatic S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Shakespear [1]	GJX	130	Shakespear Shipping Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Shandon GBYJ [1] ..	GBYJ	150	The Foreland Shipping & Trading Co.	300, **600**	P G ..	X	0.40	—
Shannonmede [1]	ZUK	—	Canute S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Sheaf Arrow [28]	GDWF	100	Sheaf Steam Shipping Co., Ltd...	300, **600**	P G ..	X	0.40	—
Sheaf Dart [1]	MLX	160	Sheaf S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Sheaf Don [1]	ZOL	145	Sheaf S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Sheaf Lance [1]	XMT	150	Sheaf S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Sheafmead [1]	YFP	150	Sheaf S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Sheaf Mount [1]	GBPW	145	Sheaf S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Sheaf Spear [1]	MXH	120	Sheaf S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Sheerness [1]	GFMJ	—	Clyde Shipping Co., Ltd. ..	300, 450, **600**	P G ..	X	0.10[28]	1.00[20]
Shelley [1]	GFNL	—	Shakespear Shipping Co., Ltd...	300, **600**	P G ..	X	0.40	—
Sherard Osborn [3] ..	MFK	140	Eastern Telegraph Co., Ltd. ..	300, 450, **600**	P ..	—	0.40	—
Sheridan XHU [1] ..	XHU	150	Liverpool Brazil & River Plate S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—
Shonga [1]	ZMI	—	Elder Line, Ltd.	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Shropshire [8]	GSF	330	**Federal S.N. Co., Ltd.**	300, 450, **600**	P G ..	0900 to 1230 1300 to 1400 1600 to 1800 2000 to 2200	0.40	—
Siam City [1]	GBWR	—	St. Just S.S. Co., Ltd. ..	300, 450, **600**	P G	X	0.40	—
Siamese Prince [1] ..	YXN	200	Prince Line, Ltd.	300, **600**	P G ..	N	0.40	—
Siberian Prince [1] ..	ZTI	180	Prince Line, Ltd.	300, **600**	P G ..	N	0.40	—
Sicilia GMC [1] ..	GMC	225	P. & O. S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—
Sicilian [1]	MUN	170	Allan Line S.S. Co.	300, **600**	P G ..	N	0.40	—
Sicily [1]	ESO	175	**D. MacIver, Sons & Co., Ltd.** ..	300, **600**	P G ..	X	0.40	—
Siddons [1]	ZHY	160	Liverpool Brazil & River Plate S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Sidlaw Range [1]	XHV	—	Furness, Withy & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Sikh YKZ [1]	YKZ	170	Asiatic S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Silarus [1]	GBRC	130	Royal Mail Steam Packet Co.	300, **600**	P G	N	0.40	—	
Silverlight [2]	GDWS	100	Starlight S.S. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Silversand [1]	EKA	140	W. P. & T. James	300, **600**	P G	X	0.40	—	
Silvertown [1]	GMD	225	Anglo-American Oil Co.	300, **600**	P G	—	0.40	—	
Singapore [1]	YYA	175	Westminster Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Singleton Abbey [2]	GDLX	100	Melrose Abbey Shipping Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Siptah [1]	OFX	170	Moss S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Sir Harvey Adamson [1]	MUK	170	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Siris [1]	GBRD	—	Royal Mail S.P. Co.	300, **600**	P G	N	0.40	—	
Sirsa [1]	GDNQ	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Sithonia [1]	YUO	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Sitra [1]	EOJ	170	J. Moss & Co.	300, **600**	P G	X	0.40	—	
Sittang [1]	GRT	170	P. Henderson & Co.	300, **600**	—	—	—	—	
Skegness [1]	EXU	150	English S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Skeeryvore [1]	GFMK	—	Clyde Shipping Co., Ltd.	300, 450, **600**	P G	X	0.10[20]	1.00[20]	
Skipton Castle [1]	ETJ	145	Lancashire Shipping Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Slav	YHY	—	Ottoman Line, Ltd.	300, **600**	P G	X	0.40	—	
Slavic Prince [1]	XIV	150	Prince Line, Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Slieve Bawn [3]	YWC	135	L. & N.W. Railway Co.	300, **600**	P G	N	0.05[20]	0.50[20]	
Slieve Gallion [4]	YWE	135	L. & N.W. Railway Co.	300, **600**	P G	N	0.05[20]	0.50[20]	
Slievemore [3]	YWF	135	L. & N.W. Railway Co.	300, **600**	P G	N	0.05[20]	0.50[20]	
Smolensk [1]	ODS	125	Ellerman's Wilson Line, Ltd.	300, **600**	P G	X	0.15[21]	1.90[21]	
Snaefell [1]	EZL	—	Isle of Man S.P. Co., Ltd.	300, **600**	P G	N	0.10[20]	1.00[20]	
Snowdon [3]	YWG	135	L. & N.W. Railway Co.	300, **600**	P G	N	0.05[20]	0.50[20]	
Sobo [1]	GDQZ	—	W. R. Davies & Co.	300, **600**	P G	X	0.40	—	
Socrates [1]	ZHZ	160	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	

Sofala[1] ..	GOH	160	British India S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Soldier Prince[1] ..	ZFW	190	Prince Line, Ltd.	300, 600	P G	..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Solen[1] ..	GFLC	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, 600	P G	..	X	0.40	—
Solfels[1] ..	GBKY	—	H. Hogarth & Sons	300, 600	P G	..	X	0.40	—
Solingen[1] ..	GBQF	—	Easton Greig Co.	300, 600	P G	..	X	0.40	—
Somali MIW[1] ..	MIW	230	P. & O. S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Somersby[1] ..	ZYP	150	Sir R. Ropner & Co., Ltd.	300, 600	P G	..	X	0.40	—
Somerset EPL[1] ..	EPL	150	Federal S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Somersetshire[25] ..	GDZP	100	Bibby S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Somerton[1] ..	GCNP	—	Atlantic Shipping & Trading Co., Ltd.	300, 600	P G	..	X	0.40	—
Somme GBQV[1] ..	GBQV	200	Royal Mail Steam Packet Co.	300, 600	P G	..	N	0.40	—
Songster[1] ..	GXF	—	Charente Steamship Co., Ltd.	300, 600	P G	..	X	0.40	—
Sonnenfels[1] ..	GBDF	—	Thos. Law & Co.	300, 600	P G	..	X	0.40	—
Sorata[1] ..	MIJ	210	Pacific S.N. Co., Ltd.	300, 600	P G	..	0900 to 1100 2000 to 0200	0.40	—
Soroka[1] ..	ZUD	—	Ellerman's Wilson Line, Ltd.	300, 600	P G	..	X	0.40	—
Sorrento[1] ..	EXJ	115	Ellerman's Wilson Line, Ltd.	300, 600	P G	..	X	0.40	—
Sotero[1] ..	ODC	145	Atlantic & Eastern S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Soudan[1] ..	MNB	200	P. & O. S.N. Co., Ltd.	300, 600	P G	..	N	0.40	—
Southern XEV[1] ..	XEV	175	Fratres, Ltd.	300, 600	P G	..	X	0.40	—
Southern Coast[1] ..	BDP	140	Coast Lines, Ltd.	300, 600	P G	..	X	0.05[20]	0.50[20]
Southern Isles[1] ..	YJH	—	Southern Whaling & Sealing Co., Ltd.	300, 600	P G	..	X	0.40	—
Southgate[1] ..	ZCZ	175	Turnbull, Scott S.S. Co.	300, 600	P G	..	X	0.40	—
Southlea[1] ..	BCT	—	Cardiff S.N. Co., Ltd.	300, 600	P G	..	X	0.40	—
Southmead[1] ..	GOG	150	Western Counties Shipping Co., Ltd.	300, 450, 600	P G	..	X	0.40	—
South Pacific[1] ..	YCR	160	Countess Warwick S.S Co., Ltd.	300, 600	P G	..	X	0.40	—
Southport[1] ..	EKH	155	Sefton S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
South Stack[3] ..	YWH	135	L. & N.W. Railway Co.	300, 600	P G	..	N	0.05[20]	0.50[20]
South-Western Miller[1] ..	MTY	190	Norfolk & N. American S. Shpg. Co., Ltd.	300, 600	P G	..	X	0.40	—
Spaniel[1] ..	GDTZ	—	G. & J. Burns, Ltd.	300, 600	P G	..	X	0.10[20]	1.00[20]
Spanker[3] ..	GDYB	100	Witherington & Everett	300, 600	P G	..	X	0.40	—
Spartan Prince[1] ..	BFD	—	Prince Line, Ltd.	300, 600	P G	..	X	0.40	—
Speaker[1] ..	LTG	—	Charente Steamship Co., Ltd.	300, 600	P G	..	X	0.40	—
Specialist[1] ..	BFK	—	Charente Steamship Co., Ltd.	300, 600	P G	..	X	0.40	—
Spectator[1] ..	YCV	170	Charente S.S. Co.	300, 600	P G	..	X	0.40	—
Speedonia[1] ..	GDCJ	—	Anglo-Saxon Petroleum Co., Ltd.	300, 600	P G	..	X	0.40	—
Spermina[1] ..	EYH	170	A. W. Small	300, 600	P G	..	X	0.40	—
Spero[3] ..	GDWZ	100	Pelton S.S. Co., Ltd.	300, 600	P G	..	X	0.40	—
Spezia[1] ..	GBLR	—	Houlder, Middleton & Co., Ltd.	300, 600	P G	..	X	0.40	—
Spilsby[1] ..	EKD	—	Sir R. Ropner & Co., Ltd	300, 600	P G	..	X	0.40	—
Spirila[1] ..	GFLB	—	Anglo-Saxon Petroleum Co., Ltd.	300, 450, 600	P G	..	X	0.40	—
Springburn[1] ..	EVB	—	General Maritime Trust, Ltd.	300, 600	P G	..	X	0.40	—
Stagpool[1] ..	ETM	130	Pool Shipping Co., Ltd.	300, 600	P G	..	X	0.40	—
Stambul[1] ..	GBZY	—	J. Westoll	300, 600	P G	..	X	0.40	—
Stanley Hall[1] ..	EOR	160	Hall Line, Ltd.	300, 600	P G	..	X	0.40	—
Stanmore[1] ..	EVU	140	Johnston Line, Ltd.	300, 600	P G	..	X	0.40	—
Starlight[1] ..	GBZC	—	E. P. Martin	300, 600	P G	..	—	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Statesman[1]	EPU	170	Charente S.S. Co.	300, **600**	P G	X	0.40	—	
Staveley[3]	EQQ	—	Great Central Railway	300, 500, **600**	P G	X	0.40	—	
Stellina[1]	YGC	170	Stella Shipping Co., Ltd	300, **600**	P G	X	0.40	—	
Stentor[1]	YOJ	170	Ocean S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Stephan[1]	GBWL	—	Eastern Telegraph Co.	300, **600**	P G	X	0.40	—	
Stephen[1]	MDJ	170	Booth S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Stockport[2]	ODZ	—	Great Central Railway	300, **600**	P G	X	0.40	—	
Stockwell[2]	GZJ	225	T. & J. Brocklebank, Ltd.	300, 450, **600**	P G	X	0.40	—	
Stolberg[1]	GDKM	—	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Stork YKK[3]	YKK	—	General Steam Navigation Co., Ltd.	300, **600**	P G	X	0.40	—	
Strabo[1]	YOS	160	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Strathearn[1]	BEC	170	Shankland & Co.	300, **600**	P G	X	0.40	—	
Strathfillan[1]	ZRK	170	Anglo-American Oil Co., Ltd.	300, **600**	P G	X	0.40	—	
Strathlorne[1]	BNI	—	Strathlorne S.S. Co., Ltd.	3 0, **600**	P G	X	0.40	—	
Stroma[1]	BEN	190	Isles S. Shpg. Co., Ltd.	300, **600**	P G	X	0.40	—	
Strombus[1]	MYQ	180	Anglo-Saxon Petro. Co., Ltd.	300, **600**	P G	X	0.40	—	
Stuartstar[1]	MYP	250	Union Cold Storage Co., Ltd.	300, **600**	P G	X	0.40	—	
Student[1]	ZXG	170	Charente S.S. Co.	300, **600**	P G	X	0.40	—	
Sudbury EJV[1]	EJV	155	Alexander Co.	300, **600**	P G	X	0.40	—	
Suevic[1]	MJC	230	Oceanic S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Suffolk GRV[3]	GRV	300	Potter, Trinder & Gwyn	300, **600**	P G	0900 to 1230 1300 to 1400 1600 to 1800 2000 to 2200	0.40	—	
Sumatra XUF	XUF	—	British India S.N. Co., Ltd.	300, **600**	P G	X	—	—	
Sunbank[1]	GCYN	—	Sun Shipping Co., Ltd.	—	—	—	—	—	
Sunfield[1]	GCYL	—	Sun Shipping Co., Ltd.	—	—	—	—	—	
Sunik[1]	YEA	170	Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
Suncliff[1]	GCYM	120	Sun Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Sunland[1]	ZET	120	Sun Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Sunningdale[1]	OFO	115	Lambton & Hetton Collieries, Ltd.	300, **600**	P G	X	0.05[20]	0.50[20]	
Sunpath[1]	GCMZ	140	Sun Shipping Co., Ltd.	300 **600**	P G	X	0.40	—	
Sunray[1]	BAN	150	Scarisbrick S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Surada[1]	GDNR	150	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Surat[1]	GCPQ	—	Bank Line, Ltd.	300, **600**	P G	N	0.40	—	
Surrey[1]	GCBJ	180	Federal S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Susquehanna ERG[1]	ERG	—	Union-Castle Mail S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	

Sussex[1]	MVS	240	Federal S.N. Co., Ltd.	300, 600	P G	0900 to 1240 1300 to 1400 1600 to 1800 2000 to 2200	0.40	—
Sutherland Grange[1]	GMM	180	Houlder Line, Ltd.	300, 600	P G	X	0.40	—
Sutlej[1]	GWL	115	James Nourse, Ltd.	300, 600	P G	X	0.40	—
Sutton Hall[1]	ZJG	150	Ellerman Lines, Ltd.	300, 600	P G	X	0.40	—
Suveric[1]	GMO	180	A. Weir & Co.	300, 600	P G	N	0.40	—
Suwanee MIY[1]	MIY	160	Anglo-American Oil Co., Ltd.	300, 600	P G	X	0.40	—
Swainby[1]	ZYQ	160	Sir R. Ropner & Co., Ltd.	300, 600	P G	X	0.40	—
Swazi[1]	MAV	160	Ellerman & Bucknall S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Sweethope[1]	XHZ	140	Pyman Bell & Co., Ltd.	300, 600	P G	X	0.40	—
Swinburne[1]	BDR	160	Liverpool Brazil & River Plate S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Sydney GCXF[1]	GCXF	—	British India S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Sydney Reid[1]	XJL	150	Bede S. Shpg. Co., Ltd.	300, 600	P G	X	0.40	—
Syria GMP[1]	GMP	250	P. & O. S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Syrian Prince	GBRJ	—	Prince Line, Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
S. Albans[9]	MGG	240	Eastern & Australian S.S. Co., Ltd.	300, 600	P G	N	0.40	—
S. Albans Abbey[1]	GBFY	—	David S.S. Co., Ltd.	300, 450, 600	P G	X	0.40	—
S. Andrew GYJ[3]	GYJ	120	Fishguard & Rosslare Railway & Harbour Co.	300, 600	P G	N	0.40	—
S. Andrew GCBV[1]	GCBV	—	Rankin, Gilmour & Co., Ltd.	300, 600	P G	X	0.40	—
S. Andrews[1]	GBNL	—	Morel Shipping Trust, Ltd.	300, 600	P G	X	0.40	—
S. Augustines Abbey[1]	GBLQ	—	David S.S. Co., Ltd.	300, 450, 600	P G	X	0.40	—
S. Bede[1]	GCBT	175	Rankin, Gilmour & Co., Ltd.	300, 600	P G	X	0.40	—
S. Blas[27]	GBWD	200	Unifruitco S.S. Co., Ltd.	300, 600	P G	N	0.40	—
S. Bruno[1]	GDWT	—	Unifruitco S.S. Co., Ltd.	300, 600	P G	N	0.40	—
S. Clair[28]	GBMS	100	North of Scotland and Orkney and Shetland S.N. Co., Ltd.	300, 600	P G	X	0.10[20]	1.00[20]
S. David[3]	GYL	120	Fishguard & Rosslare Railway & Harbour Co.	300, 600	P G	N	0.40	—
S. Denis[3]	ZCK	120	Great Eastern Railway Co.	300, 450, 600[22]	P G	N	0.10[20]	1.00[20]
S. Dunstan[1]	YEL	160	Rankin, Gilmour & Co., Ltd.	300, 600	P G	X	0.40	—
S. Dunstano[1]	MAN	160	Eagle Oil Transport Co., Ltd.	300, 600	P G	X	0.40	—
S. Eduardo[1]	MJV	160	Eagle Oil Transport Co., Ltd.	300, 600	P G	X	0.40	—
S. Fe[1]	GBSM	—	Furness, Withy & Co., Ltd.	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
S. Felix[1]	GFJZ	—	Eagle Oil Transport Co., Ltd.	300, 450, 600	P G	X	0.40	—
S. Fernando[1]	MUX	260	Eagle Oil Transport Co., Ltd.	300, 600	P G	X	0.40	—
S. Florentino[1]	MUQ	250	Eagle Oil Transport Co., Ltd.	300, 600	P G	X	0.40	—
S. Fraterno[1]	GYN	210	Eagle Oil Transport Co., Ltd.	300, 600	P G	N	0.40	—
S. Gaspar[1]	GFPK	—	Eagle Oil Transport Co., Ltd.	300, 450, 600	P G	X	0.40	—
S. George GIB[1]	GIB	150	Great Eastern Railway Co.	300, 600	P G	N	0.10[20]	1.00[20]
S. Gertrudis[1]	GFDK	—	Anglo-Mexican Petroleum Co., Ltd.	300, 450, 600	P G	X	0.40	—
S. Gil[1]	GDXP	—	Unifruitco S.S. Co., Ltd.	300, 600	P G	X	0.40	—
S. Gregorio[1]	MAC	230	Eagle Oil Transport Co., Ltd.	300, 600	P G	X	0.40	—
S. Jeronimo[1]	MJP	180	Eagle Oil Transport Co., Ltd.	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
S. Lamberto [1]	GFKC	—	Eagle Oil Transport Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
S. Leon [1]	GDZK	—	Eagle Oil Transport Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
S. Lorenzo [1]	MND	180	Eagle Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Lotico [1]	GBRY	—	Eagle Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Margaret [20]	GBPD	100	North of Scotland & Orkney & Shetland S.N. Co., Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
S. Margaret of Scotland [1]	YPM	175	Royal Mail Steam Packet Co.	300, **600**	P G	N	0.40	—	
S. Melito [1]	MRZ	180	Eagle Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Michael [1]	Y Z	150	Brit. & Foreign S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Nazario [1]	MUH	200	Eagle Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Ninian [20]	GBTP	100	North of Scotland & Orkney & Shetland S.N. Co., Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
S. Pablo	ZTR	200	Workman, Clark & Co.	300, **600**	P G	N	0.40	—	
S. Patricio [1]	MQY	190	Eagle Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Patrick GYM [3]	GYM	120	Fishguard & Rosslare Railway & Harbour Co	300, **600**	P G	N	0.40	—	
S. Patrick YKT [1]	YKT	145	Brit. & Foreign S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Ricardo [1]	MBR	170	Eagle Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Rognvald [20]	GCDS	100	North of Scotland & Orkney & Shetland S.N. Co., Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
S. Silvestre [1]	MYS	200	Eagle Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Stephen [1]	FVZ	—	Brit. & Foreign S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Sunniva [20]	GCLQ	100	North of Scotland & Orkney & Shetland S.N. Co., Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
S. Teodoro [1]	GFKB	—	Eagle Oil Transport Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
S. Theresa [1]	BLJ	150	Santa Clara S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Tiburcio [1]	GDYT	—	Eagle Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Tirso [1]	MAO	190	Eagle Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Tudno [3]	GNR	80	Maciver S.S. Co., Ltd.	300, **600**	P R	X	0.40	—	
S. Ubaldo [1]	GFKL	—	Eagle Oil Transport Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
S. Ugon [1]	GFKM	—	Eagle Oil Transport Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
S. Valerio [1]	MHZ	180	Eagle Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
S. Zeferino [3]	MPS	200	Eagle Oil Transport Co., Ltd.	300, **600**	P G	X	0.40	—	
Tabarka [1]	EWN	135	La Tunisienne S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Tactician MWP [1]	MWP	210	Charente S.S. Co.	300, **600**	P G	X	0.40	—	
Tafna EOC [1]	EOC	170	English & American Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Tahiti [1]	MYN	250	Union S.S. Co. of New Zealand, Ltd.	300, **600**	P G	N	0.40	—	

Tainui[1]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Tairoa[1]	GCZN	—	Shaw, Savill & Albion Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Takada[1]	MOR	230	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Talthybuis[1]	GSH	155	Ocean S.S. Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Talune[9]	GBVK	—	Union S.S. Co. of New Zealand, Ltd.	300, 600	P G ..	X	0.40	—
Tamaqua[1]	ZBG	180	Furness, Withy & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Tamar[1]	MPG	170	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Tamarac[1]	ZIC	150	Anglo-American Oil Co.	300, 600	P G ..	X	0.40	—
Tambov ZOA[1] ..	ZOA	—	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Tanfield[1]	ZNU	150	British India S.N. Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Tantah[1]	EMZ	160	Khedival Mail S.S. & Graving Dock Co., Ltd.	300, 600	P G ..	X	0.40	—
Tapti[2]	GCWX	250	James Nourse, Ltd.	300, 450, 600	P G ..	X	0.40	—
Tapton[1]	ZUG	170	Batheaston Trading Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Tara GMQ[1]	GMQ	225	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Taransay[1]	OCW	150	Sutherland S.S. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Tarantia[12]	YRE	—	Henderson Bros. (Anchor Line) ..	300, 600	—	—	—	—
Taroba[1]	GMR	225	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Tartar Prince[1]	ZLY	150	Prince Line, Ltd.	300, 600	P G ..	X	0.40	—
Tasmania GBPS[1] ..	GBPS	—	F. & W. Ritson	300, 600	P G ..	X	0.40	—
Tasmanian Transport[1]	ZEE	135	Empire Transport Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Tatarrax[3]	GSK	140	Tank Storage & Carriage Co., Ltd.	300, 600	P ..	X	—	—
Taviuni[9]	GFYL	—	Union S.S. Co. of N.Z., Ltd. ..	—	—	—	—	—
Taxandrier[1]	OFF	150	Lloyd Royal Belge (Gt. Britain) Ltd.	300, 600	P G ..	X	0.40	—
Teenkai[4]	YPP	160	China Mutual S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Teesbridge[1]	YOX	140	North of England S. Shpg. Co. ..	300, 600	P G ..	X	0.40	—
Teespool[1]	YGK	180	Pool Shipping Co.	300, 600	P G ..	X	0.40	—
Teesta[1]	GMT	210	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Teiresias[1]	ZJZ	225	Ocean S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Telamon[1]	ZKA	210	Ocean S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Telconia[3]	MCJ	140	Telegraph Construction & Insur. Co.	300, 600	P ..	X	—	—
Telemachus ZAI[1] ..	ZAI	180	Ocean S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Telesfora de Larrinaga[1]	GQY	130	Miguel de Larrinaga S.S. Co. ..	300, 600	P G ..	X	0.40	—
Telima[3]	MZD	50	Ship Salvage Corporation, Ltd. ..	300, 600	P ..	X	—	—
Tempestuous[1] ..	GBFR	—	Watkin James Williams ..	300, 600	P G ..	X	0.40	—
Tempus[1]	OCF	145	Tempus Shipping Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Tennyson[1]	GDG	250	Liverpool Brazil & River Plate S.N. Co., Ltd.	300, 600	P G ..	N	0.40	—
Tenterden[1]	YGN	150	Furness, Withy & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Teucer[1]	GSJ	145	Ocean S S. Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Teutonic[1]	MTC	260	Oceanic S.N. Co., Ltd.	300, 600	P G ..	N	0.40	—
Teviot[1]	ZHO	160	Royal Mail Steam Packet Co. ..	300, 600	P G ..	X	0.40	—
Tewkesbury[1]	XLY	120	Alexander S.S. Co.	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Thamesmede [1]	BBO	115	Mede Line, Ltd.	300, **600**	P G	X	0.40	—	
Themis S [1]	XEE	145	New Shipping & Mercantile Co., Ltd.	300, **600**	P G	X	0.40	—	
Themistocles MGM [1]	MGM	250	G. Thompson & Co., Ltd.	300, **600**	P G	X	0.40	—	
Theseus [1]	ZTB	225	Ocean S.S. Co.	300, **600**	P G	X	0.40	—	
Thespis	ZAG	—	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Thessaly [1]	EMT	160	D. McIver Sons & Co., Ltd.	300, **600**	P G	X	0.40	—	
Thistle GDVF [1]	GDVF	—	Laird Line, Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
Thistlemore [1]	BOQ	180	Johnstone Line, Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Thistletor [1]	GBSR	130	Albyn Line, Ltd.	300, **600**	P G	X	0.40	—	
Thomas Crofton [1]	GDRY	—	H. Ford, Esq.	300 **600**	P	X	0.10[20]	1.00[20]	
Thongwa [1]	GMU	210	British India S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Thornbury [1]	GDKX	130	Alexander Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Thorpe Grange [1]	YWP	230	Houlder Line, Ltd.	300, **600**	P G	X	0.40	—	
Thurland Castle [1]	YCD	150	Lancashire Shipping Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Thurso [1]	GBVZ	—	Ellerman's Wilson Line, Ltd.	300, **600**	P G	X	0.40	—	
Thysa [1]	GDBK	140	J. Edgar & Co.	300, **600**	P G	X	0.40	—	
Tiara [1]	EYJ	150	Hall Bros. S.S. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Tibermede [1]	XLQ	150	Mede Line, Ltd.	300, **600**	P G	X	0.40	—	
Tiberton	YGW	—	R. Chapman & Son	300, **600**	P G	X	0.40	—	
Tiger GDTX [1]	GDTX	—	G. & J. Burns, Ltd.	300, **600**	P G	X	0.10[20]	1.00[20]	
Ting Sang [1]	GFKV	—	Indo-China Steam Nav. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Tintern Abbey [1]	XHH	120	Melrose Abbey Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Tintoretto [1]	ZNM	180	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Titan GSO [1]	GSO	170	Ocean S.S. Co., Ltd.	300, 450, **600**	P G	X	0.40	4.00	
Tiverton MXZ [1]	MXZ	140	Associated Oil Carriers, Ltd.	300, [illegible]	P G	X	0.40	—	
Tofua [1]	GPYM	250	Union S.S. Co. of N.Z., Ltd.	[illegible]	P G	X	[illegible]	—	

Toloa [1]	BUV	300	Clark & Service	300, 600	P G ..	X	0.40	—	
Tonawanda [1]	GMV	140	Anglo-American Oil Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Torilla [1]	GOJ	190	British India S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Toromeo [2]	CGL	175	Req. by British Government	300, 600	P G ..	X	0.40	—	
Toronto GBS [1] ..	GBS	220	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	0800 to 1300 1400 to 1700 1800 to 2200	0.40	—	
Torrent [1]	ZZX	—	Felbridge S.S. Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Tortuguero [1]	GDCZ	—	Elders & Fyffes, Ltd.	300, 600	P G ..	X	0.40	—	
Tosto OCQ [1]	OCQ	140	Pelton S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trafford Hall [1] ..	MSL	190	Ellerman Lines, Ltd.	300, 600	P G ..	X	0.40	—	
Transmitter [2]	GQO	150	Eastern Telegraph Co., Ltd. ..	300, 450, 600	P ..	X	0.40	—	
Trebartha [2]	GDWP	250	Hain Steamship Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—	
Trecarne [1]	ZUI	130	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trecarrel	GOX	180	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Tredenham [1]	GBCF	—	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Tredennick [2]	GDWQ	250	Hain Steamship Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—	
Trefusis [1]	ZTW	—	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Tregantle	GXA	100	E. Hain & Son	300, 600	P G ..	X	0.40	—	
Tregarth [1]	ZDY	140	Cory Colliers, Ltd.	300, 600	P G ..	X	0.40	—	
Tregarthen	ZDE	—	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Tregenna [1]	GCDX	170	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Treglisson [1]	XEM	—	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Tregonell [1]	XKB	—	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Tregothnan [1]	BNA	150	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Tregurno	ELR	—	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trehawke [1]	ZUF	130	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trekieve [1]	GCMV	—	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trelawny [1]	YIS	150	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trelevan [1]	GCWZ	—	Hain Steamship Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Trelissick [1]	GNX	175	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Treloske [1]	LSO	150	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trelyon [1]	GCKV	175	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trematon [1]	GOY	175	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Tremayne [1]	LUJ	155	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Tremeadow [1]	XUJ	155	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Tremere [1]	GBLC	—	Hain Steamship Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Tremorvah [1]	GBPJ	190	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Treneglos [1]	XKC	150	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trent [1]	GUH	250	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—	
Trentino [1]	GRX	—	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.40	—	
Tresillian [1]	XUO	130	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Tresithney [1]	GBFW	—	Hain Steamship Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Trevalgan [1]	BAB	140	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trevanion [1]	YCI	130	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trevarrack [1]	GOM	190	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trevaylor [1]	YGG	130	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trevean [1]	XLK	140	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trevelyan [1]	GBRX	170	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Treverbyn [1]	GCBP	—	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trevessa [1]	GCVJ	—	Hain Steamship Co., Ltd. ..	300, 600	P G ..	X	0.40	—	
Trevethoe [1]	ZUH	150	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trevider [1]	OEF	140	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trevilley [1]	YIW	115	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	
Trevince [1]	YRX	130	Hain S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Trevisa [1]	ZGR	105	Fairfield S.S. Co., Ltd.	300, **600**	P G	X	0.15 [21]	0.90 [21]	
Trevithick [1]	GCXZ	—	Hain Steamship Co., Ltd.	300, **600**	P G	X	0.40	—	
Trevorian [2]	GDWR	250	Hain Steamship Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Trevose [1]	XKD	120	Hain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Trewellard [1]	GIE	150	Hain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Trewidden [1]	BMT	130	Hain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Trewinnard [1]	GBPZ	—	Hain Steamship Co., Ltd.	300, **600**	P G	X	0.40	—	
Trewyn [1]	GCMW	—	Hain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Triden ZWX [1]	ZWX	150	Hall Bros. S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Trincoto [1]	ENM	160	Bear Creek Oil & Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Tritonia [1]	ZNP	150	Donaldson Line, Ltd.	300, **600**	P G	X	0.40	—	
Trivia [1]	GRK	—	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Troilus [3]	GDZB	250	China Mutual S.N. Co., Ltd.	300, 450, **600**	P G	X	0.40	—	
Trojan Prince [1]	XLS	150	Prince Line, Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Trophon [1]	ERM	—	Anglo-Saxon Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
Tropic [1]	GDU	175	Oceanic S.N. Co., Ltd.	300, **600**	P G	X	0.40	—	
Trostan	EQJ	—	Normandy Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Troutpool [1]	ETL	110	Pool Shipping Co., Ltd.	300, **600**	P G	X	0.40	—	
Tudor Prince [1]	YJK	130	Prince Line, Ltd.	300, **600**	P G	X	0.40	—	
Tudorstar [1]	MRB	250	Union Cold Storage Co., Ltd.	300, **600**	P G	X	0.40	—	
Tullamore [1]	XMZ	—	Johnston Line, Ltd.	300, **600**	P G	X	0.40	—	
Tunisian [1]	MTN	200	Allan Line S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Turbo [1]	ZNA	200	Anglo-Saxon Petro. Co., Ltd.	300, **600**	P G	X	0.40	—	
Turcoman [1]	GCPB	200	Dominion Line	300, **600**	P G	X	0.40	—	
Turkestan [1]	BNQ	150	Hindustan S. Shpg. Co., Ltd.	300, **600**	P G	X	0.40	—	
Turkistan [1]	GVY	—	Strick Line, Ltd.	300, **600**	P G	X	0.40	—	
Tuscan Prince [1]	YJG	140	Prince Line, Ltd.	300, **600**	P G	X	0.40	—	
Tuscanstar [2]	YVS	250	Union Cold Storage Col, Ltd.	300, 450, **600**	P G	X	0.40	—	
Tuscany [1]	ZKR	180	D. MacIvers Sons & Co.	300, **600**	P G	X	0.40	—	
Tuscarora EYE [1]	EYE	200	Anglo-American Oil Co., Ltd.	300, **600**	P G	X	0.40	—	
Tusculum [1]	ERK	—	Rome S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Twickenham [1]	EWS	150	Britain S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Twilight [1]	BMN	130	Portloe S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Tyde[illegible] [1]	ZJM	240	Ocean S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	X	0.40	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	X	[illegible]	[illegible]	

Tyne[1]	GAM	170	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Tynedale[1]	GDRB	—	Palmers' Shipbuilding & Iron Co., Ltd.	300, 600	P G ..	X	0.40	—
Tynemede[1]	BBQ	130	Canute S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Tynemouth[1]	EYX	100	Burnett & Co.	300, 600	P G ..	X	0.05[20]	0.50[20]
Tynwald[1]	GFPW	—	Isle of Man S.P. Co., Ltd. ..	300, 600	P G ..	N	0.10[20]	1.00[20]
Tyria[1]	ZZW	175	Cunard S.S. Co., Ltd.	300, 600	P G ..	N	0.40	—
Uhlenhorst[1]	GBPC	—	Morel, Ltd.	300, 600	P G ..	X	0.40	—
Ujina[1]	GOR	180	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Ula GOL[1]	GOL	160	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Ulidia[1]	BGP	130	Cliffe S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Ulster MCW[1]	MCW	175	City of Dublin Steam Packet Co.	300, 600	P G ..	N	0.05[20]	0.50[20]
Ulua[1]	BOE	210	Clark & Service	300, 600	P G ..	N	0.40	—
Ulversmead[1]	BFL	—	Western Counties Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Ulysses GBU[1]	GBU	280	China Mutual S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Umfuli[2]	GFYW	125	Bullard, King & Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Umgeni	BLV	—	Bullard, King & Co.	300, 600	P G ..	X	0.40	—
Umhloti[1]	GCDJ	—	Bullard, King & Co.	300, 600	P G ..	X	0.40	—
Umkuzi[2]	GCXN	125	Bullard, King & Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Umona[1]	BLW	—	Bullard, King & Co.	300, 600	B G ..	X	0.40	—
Umsinga[2]	GDBF	125	Bullard, King & Co.	300, 450, 600	P G ..	X	0.40	—
Umta[1]	GON	170	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Umtali[1]	ERI	200	Bullard, King & Co.	300, 600	P G ..	X	0.40	—
Umtata[1]	GCDF	—	Bullard, King & Co.	300, 600	P G ..	X	0.40	—
Umvolosi[2]	GCWT	125	Bullard, King & Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Umvuma[1]	ZQR	180	Bullard, King & Co.	300, 600	P G ..	X	0.40	—
Umzinto[1]	ERF	—	Bullard, King & Co., Ltd. ..	300, 450, 600	P G ..	X	0.40	—
Umzumbi[1]	EVF	—	Bullard, King & Co.	300, 600	P G ..	X	0.40	—
Unda[1]	GDCP	—	Anglo-Saxon Petroleum Co., Ltd.	300, 600	P G ..	X	0.40	—
Unio	ZPX	140	Anglo-Saxon Petro. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Union City[1]	GCWB	—	St. Just S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Upada[1]	GOO	200	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Upminster[1]	XHM	100	J. Hudson & Co., Ltd.	300, 600	P G ..	X	0.05[20]	0.50[20]
Urbino[1]	GBWP	—	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.40	—
Urlana[1]	GOP	180	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Ursus[1]	YYR	130	Everett & Newbigin	300, 600	P G ..	X	0.40	—
Uskmouth[2]	GCWV	100	Uskside S.S. Co., Ltd.	300, 450, 600	P G ..	X	0.40	—
Valacia[1]	ZKV	190	Cunard S.S. Co., Ltd.	300, 600	P G ..	N	0.40	—
Valdura[1]	YPT	180	Valdura S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Valemead[1]	EVN	160	Western Counties Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Valemore[1]	XKW	150	Johnston Line, Ltd.	300, 600	P G ..	X	0.40	—
Valiant[1 16]	GCPV	150	Lord Pirrie	300, 600	P G ..	X	0.40	—
Vancouver ERY[1] ..	ERY	180	Vancouver S.S. Co., Ltd... ..	300, 600	P G ..	X	0.40	—
Vandyck[1]	GFNC	—	Liverpool, Brazil & River Plate S. N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Vanellus[1]	GDVW	—	Cork S.S. Co., Ltd.	300, 600	P G ..	X	0.10[20]	1.00[20]
Varela[1]	MSR	220	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Vardulia[1]	YXS	140	Cunard S.S. Co.	300, 600	P G ..	X	0.40	—
Varsova[1]	ZGN	240	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Varzin[1]	XIR	180	Grahams & Co.	300, 600	P G ..	X	0.40	—
Vasari[1]	GMZ	—	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, 600, 2100[26], 2600[26]	P G ..	N	0.40	—
Vasco[1]	GBYK	—	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED KINGDOM—*contd.*									
Vasconia [1]	ENA	150	Cunard S.S. Co.	300, **600**	P G	X	0.40	—	
Vasna [1]	ZHE	220	British India S.N. Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Vauban [1]	MJW	250	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, **600**, 2100[18], 2200[18]	P G	N	0.40	—	
Vaux [1]	GDNL	120	Normandy Shipping Co., Ltd.	300, **600**	P G	X	0.15[21]	1.50[21]	
Vedic [1]	ZNG	300	Oceanic S.N. Co., Ltd.	300, **600**	P G	N	0.40	—	
Vellavia [26]	YYM	150	Cunard S.S. Co.	300, **600**	P G	N	0.40	—	
Venetia GDNP [1]	GDNP	190	Steam Yacht belonging to James White, Esq.	300, **600**	P	X	—	—	
Venetian [1]	YIB	160	Ellerman Lines, Ltd.	300, **600**	P G	N	0.40	—	
Venice [1]	OEB	130	Furness, Withy & Co., Ltd.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Vennachar [1]	ZHK	170	Vennachar S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Vennonia [1]	EYI	150	Cunard S.S. Co., Ltd.	300, **600**	P G	N	0.40	—	
Venosta [17]	GDFT	150	Venosta, Ltd., Halifax (N.S.)	300, **600**	P	X	0.40	—	
Vera Kathleen [1]	ZDX	—	Hartlepool Seatonia S.S. Co., Ltd.	300, **600**	P G	X	0.40	—	
Vestris [1]	MJZ	250	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, **600**, 2100[28], 2200[28]	P G	N	0.40	—	
Victoria and Albert	GFUR	—	—	—	P G	—	...	—	
Victoria de Larrinaga [1]	EMF	175	Miguel de Larrinaga S.S. Co.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Victorian [1]	MVN	200	Allan Line	300, **600**, 2100[26], 2200[26]	P G	N	0.40	—	
Victorian Transport [1]	XEN	140	Empire Transport Co.	300, **600**	P G	X	0.40	—	
Vigo ZVT [1]	ZVT	160	Ellerman's Wilson Line	300, **600**	P G	0900 to 1300 1500 to 1800 2000 to 2300	0.40	—	
Viking MCD [3]	MCD	140	Amazon Tel. Co.	300, **600**	P	X	—	—	
Viking MVQ [1]	MVQ	—	Isle of Man S.P. Co., Ltd.	300, **600**	P G	N	0.10[10]	1.00[10]	
Vikingstar [3]	GDLT	250	Blue Star Line (1920), Ltd.	300, 450, [illegible]	P G	X	0.40	[illegible]	
Vindelia [1]	MXD	150	Cunard S.S. Co.	[illegible]	P G	[illegible]	[illegible]	—	
Virawa [1]	Z[illegible]	110	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	—	

[illegible]			S.N. Co.			N	0.40	—
Virgilia [1]	GXB	150	Cunard S.S. Co.	300, 600	P G	N	0.40	—
Virginian MGN [1]	MGN	280	Allan Line	300, 600	P G	N	0.40	—
Visigoth [1]	BDV	140	Helmsdale S.S. Co.	300, 600	P G	X	0.40	—
Vita [1]	MZV	230	British India S.N. Co.	300, 600	P G	X	0.40	—
Vitellia [1]	BAR	140	Cunard S.S. Co.	300, 600	P G	N	0.40	—
Vitruvia [1]	GYS	180	Vitruvia S.S. Co.	300, 600	P G	X	0.40	—
Vittoria GCWR [8]	GCWR	125	Vittoria S.S. Co., Ltd.	300, 450, 600	P G	X	0.40	—
Vogtland [1]	GDFR	—	Glen Line, Ltd.	300, 600	P G	X	0.40	—
Volga [13]	ZIN	—	Volga S.S. Co.	—	—	—	—	—
Vologda CHN [1]	CHN	—	Royal Mail S.P. Co.	300, 600	P G	N	0.40	—
Volsella [1]	XIA	—	Anglo-Saxon Petroleum Co., Ltd.	300, 600	P G	X	0.40	—
Voltaire GFND [1]	GFND	—	Liverpool, Brazil & River Plate S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Volumnia [1]	GRM	190	Volumnia S.S. Co.	300, 600	P G	X	0.40	—
Volute [1]	EJY	180	Anglo-Saxon Petroleum Co.	300, 600	P G	X	0.40	—
Voronej [1]	ZLM	230	Royal Mail S.P. Co.	300, 600	P G	N	0.40	—
Vulture [1]	GDTN	—	G. & J. Burns, Ltd.	300, 600	P G	X	0.10[20]	1.00[20]
Wabana [1]	YNL	170	British & Chilian S.S. Co.	300, 600	P G	X	0.40	—
Waddon [1]	ZWY	155	Cassar, Ltd. (Malta)	300, 600	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Wahehe [1]	GBKJ	—	Shaw, Savill & Albion Co.	300, 600	P G	X	0.40	—
Wahine [9]	GFYN	250	Union S.S. Co. of New Zealand, Ltd.	300, 600	P G	X	0.10	0.60
Waihemo [1]	GDBQ	—	Union S.S. Co.	300, 600	P G	X	0.40	—
Waihora [9]	GFYP	325	Union S.S. Co. of N.Z., Ltd.	300, 600	P G	X	0.20	—
Waikawa [1]	GCNY	—	Union S.S. Co.	300, 600	P G	X	0.40	—
Waimana [1]	GNE	230	Shaw, Savill & Albion Co.	300, 600	P G	X	0.40	—
Waimarino [9]	YUS	200	Union S.S. Co.	300, 600	P G	2030 to 0030 0900 to 1030 1200 to 1300 1400 to 1430 1630 to 1700	0.40	—
Waimate [10]	MOS	140	New Zealand S.S. Co.	300, 600	P G	X	0.40	—
Waipara [10]	GNK	125	British India S.N. Co.	300, 600	P G	X	0.40	—
Wairuna [1]	ENL	—	Union S.S. Co.	300, 600	P G	X	0.40	—
Waitemata [1]	GBNM	—	Union S.S. Co.	300, 600	P G	X	0.40	—
Waitomo [9]	VMJ	—	Union S.S. Co. of N.Z., Ltd.	300, 600	P G	X	0.40	—
Waiwera [1]	MRV	240	Shaw, Savill & Albion Co.	300, 600	P G	X	0.40	—
Wallace MQX [1]	MQX	—	English S.S. Co.	300, 600	P G	X	0.40	—
Walmer Castle [1]	MQH	200	Union Castle Mail S.S. Co.	300, 600	P G	N	0.40	—
Waltham [1]	YBA	—	Thompson S.S. Co.	300, 600	P G	X	0.40	—
Waltham Abbey [1]	GBZR	—	David S.S. Co., Ltd.	300, 450, 600	P G	X	0.40	—
Walton Hall [1]	MTH	150	Ellerman Lines	300, 600	P G	X	0.40	—
Wanderer ZBO [1]	ZBO	180	Charente S.S. Co.	300, 600	P G	X	0.40	—
Wangaratta [1]	GBQP	210	British India S.N. Co.	300, 600	P G	X	0.40	—
War Afridi [1]	GCVR	—	C. T. Bowring & Co.	300, 600	P G	X	0.40	—
Warawala [1]	YBM	—	British India S.N. Co.	300, 600	P G	X	0.40	—
War Bahadur [1]	LUN	150	C. T. Bowring & Co.	300, 600	P G	X	0.40	—
War Begum [1]	XMK	180	British Tanker Co.	300, 600	P G	X	0.40	—
War Bharata [1]	GCVD	—	British Tanker Co.	300, 600	P G	X	0.40	—
War Brahmin [1]	GCVS	—	C. T. Bowring & Co.	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Warcuta [1]	ZJH	—	British India S.N. Co.	300, **600**	P G	X	0.40	—	
War Diwan [1]	XMM	—	C. T. Bowring & Co.	300, **600**	P G	X	0.40	—	
Warepa [1]	YBU	—	British India S.N. Co.	300, **600**	P G	X	0.40	—	
Warfield [1]	EKT	200	British India S.N. Co.	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
War Fig.[1]	GFJL	—	Watkin James Williams	300, 450, **600**	P G	X	0.40	—	
War Gaekwar [1]	XMN	150	Anglo-Saxon Petroleum Co.	300, **600**	P G	X	0.40	—	
War Hindoo [1]	GCZK	—	Gow Harrison & Co.	300, **600**	P G	X	0.40	—	
Warialda [1]	YZJ	—	British India S.N. Co.	300, **600**	P G	X	0.40	—	
Warina [1]	XLP	—	British India S.N. Co.	300, **600**	P G	X	0.40	—	
War Jandoli [1]	ZRP	150	Anglo-Saxon Petroleum Co.	300, **600**	P G	X	0.40	—	
War Jemadar [1]	OFI	150	Anglo-Saxon Petroleum Co.	300, **600**	P G	X	0.40	—	
War Krishna [1]	GCTD	—	Lane & Macandrew, Ltd...	300, **600**	P G	X	0.40	—	
Warkworth [1]	EIO	—	Dalgliesh S.S. Co. ..	300, **600**	P G	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Warla [1]	XXD	—	British India S.N. Co.	300, **600**	P G	X	0.40	—	
War Mehtar [1]	BTC	—	Hunting & Son	300, **600**	P G	X	0.40	—	
War Nawab [1]	XML	—	British Tanker Co.	300, **600**	P G	X	0.40	—	
War Nicola [1]	XXQ	—	J. Hardie & Co.	300, **600**	P G	X	0.40	—	
War Nizam [1]	OFN	—	British Tanker Co.	300, **600**	P G	X	0.40	—	
Waroonga [1]	GCX	—	British India S.N. Co.	300, **600**	P G	X	0.40	—	
Warora [1]	BUL	—	British India S.N. Co.	300, **600**	P G	X	0.40	—	
War Pindari [1]	GDMQ	—	C. T. Bowring & Co., Ltd.	300, **600**	P G	X	0.40	—	
War Ranee	OFL	150	Anglo-Saxon Petroleum Co.	300, **600**	P G	X	0.40	—	
Warri [1]	YMI	—	British & African S.N. Co.	300, **600**	P G	X	0.40	—	
Warrior [1]	ZPQ	—	Charente S.S. Co.	300, **600**	P G	X	0.40	—	
War Sepoy [1]	OCP	145	Anglo-Mexican Petroleum Co.	300, **600**	P G	X	0.40	—	
War Shikari [1]	OFJ	140	Hunting & Son	300, **600**	P G	X	0.40	—	
War Sirdar [1]	GCVW	—	Anglo-Mexican Petroleum Co., Ltd.	300, **600**	P G	X	0.40	—	
War Spray [1]	XJX	150	R. W. J. Sutherland & Sons	300, **600**	P G	X	0.40	—	
War Sudra [1]	GCVF	—	British India S.N. Co.	300, **600**	P G	X	0.40	—	
Warszawa [1]	GZG	—	Anglo-Polish S.S. Line, Ltd..	300, **600**	P G	X	0.40	—	
Warturm	BLY	—	Grahams & Co.	300, **600**	P G	X	0.40	—	
Warwickshire [1,2]	MYO	300	Bibby S.S. Co.	300, **600**	P G	X	0.40	—	
Waterford [2]	YZY	110	Great Western Railway Co.	[illegible]	P G	X	[illegible]	—	

Watsness[1]	[illegible]		[illegible]	300, 600	P G	X	0.40	—
Wayfarer[1]	GCI	250	Charente S.S. Co.	300, 600	P G	X	0.40	—
Wearbridge[1]	EKI	—	North of England S.S. Co.	300, 600	P G	X	0.40	—
Wearpool[1]	ERU	140	Pool Shipping Co.	300, 600	P G	X	0.40	—
Wearwood[1]	BUD	140	Constantine & Pickering S.S. Co.	300, 600	P G	X	0.40	—
Wedgwood[1]	LUD	—	Wm. France Fenwick & Co.	300, 600	P G	X	0.40	—
Weehawken[1]	YZL	160	Restitution S.S. Co.	300, 600	P G	X	0.40	—
Weimar[1]	GFCQ	120	Leith, Hull & Hamburg S.P. Co., Ltd.	300, 600	P G	X	0.15[21]	1.50[21]
Weissenfelde[1]	GBQK	—	H. Hogarth & Sons	300, 600	P G	X	0.40	—
Wellpark[1]	XEA	130	Denholm Line Steamers, Ltd.	300, 600	P G	X	0.40	—
Wells City[1]	BQV	150	C. Hill & Sons	300, 600	P G	X	0.40	—
Welshman[1]	GCPD	240	British & North Atlantic S.N. Co., Ltd.	300, 600	P G	X	0.40	—
Weltondale[1]	GXK	115	T. C. Steven & Co.	300, 600	P G	X	0.40	—
Wendland[1]	GDWC	—	Furness Withy & Co., Ltd.	300, 600	P G	X	0.40	—
Wentworth[1]	GBCN	170	The Dalgliesh S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Westborough[1]	BDJ	140	Hazlewood Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Western[1]	OFB	—	J. Mathias & Sons	300, 600	P G	X	0.40	—
Western Coast[1]	GDTF	100	Coast Lines, Ltd.	300, 600	P G	X	0.10[20]	1.00[20]
Western Valleys[1]	GCYK	135	Cleeves Valleys Anthracite Collieries, Ltd.	300, 600	P G	X	0.40	—
Westhope[1]	XKX	100	Westwick S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Westmead ENK[1]	ENK	135	Western Counties Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Westmeath[1]	MJQ	190	Union S.S. Co. of New Zealand, Ltd.	300, 600	P G	X	0.40	—
Westminster Abbey[1]	GBSL	—	David S.S. Co., Ltd.	300, 450, 600	P G	X	0.40	—
Westmoreland ZBM[1]	ZBM	180	Federal S.N. Co., Ltd.	300, 600	P G	0800 to 1200 1400 to 1500 1800 to 2400	0.40	—
Westra[1]	YDO	190	Morgan & Cadogan, Ltd.	300, 600	P G	X	0.40	—
Whakatane[1]	MRI	180	New Zealand Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Whateley Hall[1]	EZW	140	Hansen Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Whimbrel[1]	YGQ	120	Cork S.S. Co., Ltd.	300, 600	P G	X	0.05[20]	0.50[20]
Whinfield[1]	BQF	150	S. S. Whinfield Co., Ltd.	300, 600	P G	X	0.40	—
Whitby Abbey[1]	GCBK	120	Hull & Netherlands S.S. Co., Ltd.	300, 600	P G	X	0.05[20]	0.50[20]
Whitegate[1]	GCXK	—	Turnbull Scott Shipping Co., Ltd.	300, 600	P G	X	0.40	—
Whitemantle[1]	GDTB	110	Gas Light and Coke Co.	300, 600	P G	X	0.10[20]	1.00[20]
Whitwood[1]	XFR	120	W. France Fenwick & Co.	300, 600	P G	X	0.40	—
Wigmore[1]	EQH	140	Johnston Line, Ltd.	300, 600	P G	X	0.40	—
Willcasino[1]	EVP	155	Convoy S.S. Co., Incorp.	300, 600	P G	X	0.40	—
Willesden[1]	EVG	140	Britain S.S. Co., Ltd.	300, 600	P G	X	0.40	—
William Balls[1]	BTF	130	W. D. C. Balls & Sons	300, 600	P G	X	0.40	—
William Carberry[1]	GDRC	—	H. Ford, Esq.	300, 600	P G	X	0.05[20]	0.50[20]
William Middleton[1]	XET	150	J. Westoll	300, 600	P G	X	0.40	—
Willkeno[1]	GRD	120	Convoy S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Willowpark[1]	GFPL	—	Denholm Shipping Co., Ltd.	300, 450, 600	P G	X	0.40	—
Wilston[1]	GTX	155	Wilston S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Wiltshire[2]	GHD	330	Federal S.N. Co., Ltd.	300, 600	P G	0900 to 1230 1300 to 1400 1600 to 1800 2000 to 0100	0.40	—
Wimbledon[1]	LUK	160	Lowlands S.S. Co., Ltd.	300, 600	P G	X	0.40	—
Wimborne[1]	EWE	160	Wimborne S.S. Co., Ltd.	300, 600	P G	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED KINGDOM—*contd.*							Francs.	Francs.	
Windsor Castle[1]	GFMS	—	Union Castle Mail S.S. Co., Ltd...	300, 450, **600** 2100[26], 2200[26]	P G ..	N	0.40	—	
Wingate[1]	OEJ	120	Furness, Withy & Co., Ltd. ..	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Winifredian[1]	MFL	250	F. Leyland & Co., Ltd.	300, **600**	P G ..	N	0.40	—	
Winkfield[1]	OCV	175	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Winnebago ZAP[1] ..	ZAP	150	Anglo-American Oil Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Winterton[1]	ODI	—	Denaby & Cadeby Main Collieries, Ltd.	300, **600**	P G ..	X	0.40	—	
W. I. Radcliffe[1] ..	LSA	145	Wynnstay S.S. Co., Ltd	300, **600**	P G ..	X	0.40	—	
Wisley[1]..	YWX	130	Mitre Shipping Co., Ltd... ..	300, **600**	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—	
Wismar[1]	GCWS	—	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Withernsea[2]	GDZM	100	Hull Steam Fishing & Ice Co., Ltd.	300, **600**	P ..	X	0.10[20]	1.00[20]	
Withington[1]	ERR	—	Times Shipping Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Woldingham	BOV	130	John Harrison, Ltd.	300, **600**	P G ..	X	0.40	—	
Wolfsburg[1]	GBDM	—	Elder Dempster & Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Wolverton[1]	ODQ	—	H. A. Brightman & Co.	300, **600**	P G ..	X	0.40	—	
Woodarra[1]	GCFK	—	British India S.N. Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Woodburn[1]	XMA	140	Maindy Shipping Co., Ltd. ..	300, **600**	P G ..	X	0.40	—	
Woodcock EJB[2] ..	EJB	—	General S.N. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Woodcock GDTV[1] ..	GDTV	—	G. & J. Burns, Ltd.	300, **600**	P G ..	X	0.10[20]	1.00[20]	
Woodfield[1]	YNA	140	Woodfield S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Woodville[1]	XKQ	140	Southern Whaling & Sealing Co.	300, **600**	P G ..	X	0.40	—	
Wordsworth[1]	GBLP	—	Shakespear Shipping Co., Ltd...	300, **600**	P G ..	X	0.40	—	
Woron[1]..	GBLX	—	Ornis S.S. Co., Ltd.	300, **600**	P G ..	X	0.40	—	
Worsley Hall[1] ..	MDW	160	Hall Line, Ltd.	300, **600**	P G ..	X	0.40	—	
Wotan CBLW	GBLW	—	T. Law & Co.	300, **600**	P G ..	X	0.40	—	
Wrangler[1]	GDXV	50	Stanlee Shipbreaking & Salvage Co., Ltd.	300, **600**	P	X			
[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		

Whitby Castle[1]	GOZ	140	Lancashire Shipping Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Wye Crag[1]	EMV	150	Wye Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Wye Tempest[1] ..	YOP	150	Wye Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Wye Valley[1]	ESV	—	Wye Shipping Co., Ltd... ..	300, 600	P G ..	X	0.40	—
Wyncote[1]	ZBI	190	Furness, Withy & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Wyneric[1]	MTB	200	Bank Line, Ltd.	300, 600	P G ..	X	0.40	—
Yang Tsze[1]	ZKO	185	China Mutual S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Yarborough YLM[1] ..	YLM	135	Letricheux Line	300, 600	P G ..	X	0.40	—
Yaroslavl[1]	ZOK	200	Royal Mail Steam Packet Co. ..	300, 600	P G ..	N	0.40	—
Yarrow[1]	GFJV	—	William Sloan & Co.	300, 450, 600	P G ..	X	0.10[20]	1.00[20]
Yildum YBR[1]	YBR	—	Furness, Withy & Co., Ltd. ..	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Yonne[1]	ZWV	180	Equinox S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
York Castle[1]	ERC	—	Union Castle Mail S.S. Co., Ltd.	300, 600	P G ..	N	0.40	—
Yorkmead[1]	EKG	—	Western Counties Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
Yorkshire[1]	GDKC	300	Bibby S.S. Co., Ltd.	300, 450, 600	P G ..	N	0.40	—
Yoseric[1]	ZFN	—	A. Weir & Co.	300, 600	P G ..	X	0.40	—
Zaida[1]	XGE	175	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Zamora[1]	ZVX	130	Turner, Brightman & Co. ..	300, 600	P G ..	X	0.40	—
Zaria[1]	ZMP	160	British & African S.N. Co., Ltd.	300, 600	P G ..	0600 to 0800 0900 to 1200 1400 to 1800 2000 to 2200	0.40	—
Zealand[1]	MTX	120	Leith, Hull & Hamburg S.P. Co., Ltd.	300, 600	P G ..	X	0.40	—
Zealandic[1]	MUZ	240	Oceanic S.N. Co., Ltd.	300, 600	P G ..	X	0.40	—
Zeeland YYF[1] ..	YYF	200	International Navigation Co., Ltd.	300, 600	P G ..	N	0.40	—
Zelo[1]	BCE	120	Pelton S.S Co., Ltd.	300, 600	P G ..	X	0.40	—
Zent[1]	GDCW	—	Elders & Fyffes, Ltd.	300, 600	P G ..	X	0.40	—
Zeppelin GCJR[1] ..	GCJR	—	Oceanic S.N. Co., Ltd.	300, 600	P G ..	N	0.40	—
Zermatt[1]	EUZ	140	Turner, Brightman & Co. ..	300, 600	P G ..	X	0.40	—
Zero[1]	EUH	160	Turner, Brightman & Co... ..	300, 600	P G ..	X	0.40	—
Zimorodok	YEX	160	Ellerman's Wilson Line, Ltd. ..	300, 600	P G ..	X	0.40	—
Zinal[1]	GDJW	—	Zinal S.S. Co., Ltd.	300, 600	P G ..	X	0.40	—
Zingara[1]	ZXA	135	Turner, Brightman & Co. ..	300, 600	P G ..	X	0.40	—
Zira[1]	XGF	160	British India S.N. Co., Ltd. ..	300, 600	P G ..	X	0.40	—
Zurichmead[1]	YIR	—	Western Counties Shipping Co., Ltd.	300, 600	P G ..	X	0.40	—
UNITED STATES OF AMERICA								
A. A. Daugherty ..	KDHX	—	National Oil Transport Co. ..	—	P G ..	X	—	—
Aaron Ward[2]	NELX	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Abangarez[3]	KDI	—	United Fruit Co.	300, 600	P G ..	N	0.40	—

[1] Operated by the Federal Telegraph Company, Hobart Building, San Francisco (Cal.)

[2] Operated by the Haller - Cunningham Company, 428, Market Street, San Francisco (Cal.)

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.
							Francs.	Francs.
UNITED STATES OF AMERICA—*contd.*								
Abarenda [8]	NOB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [13]	—
Abbeville [7]	KLN	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—
Abbot [9]	NEZS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—
Abel P. Upshur [9]	NUJD	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [13]	—
Abercos [7]	KOVR	—	U.S. Shipping Board	—	P G	X	0.20	—
Aberdeen WXIU [7]	WXIU	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—
Ablanset [5]	KIXF	—	U.S. Shipping Board	—	P G	N	0.20	—
Abner Coburn [6]	WHR	250	Libby, McNeil & Libby	300, 450, **600**, 1800	P G	X	0.20 [11]	—
Abraham Lincoln [7]	KIXS	—	U.S. Shipping Board	—	P G	X	0.20	—
Abron [6]	KEBD	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—
Absaroka [6]	WKW	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—
Absecon [5]	KSEA	150	U.S. Shipping Board	300, **600**	P G	X	0.20	—
A. C. Bedford [5]	KNZ	300	Standard Oil Co. of N.J.	300, 450, **600**	P G	X	0.20 [11] 0.40 [13]	—
Accomac [7]	—	—	—	—	P G	X	0.20	—
Achilles KPT [6]	KPT	500	Panama R.R. Co.	300 450, **600**	P G	N	0.20 [11]	—
Acme [5]	KIJ	150	Standard Transportation Co.	300, **600**	P G	X	0.20 [11] 0.40 [13]	—
Acrema [5]	KEDD	—	U.S. Shipping Board	—	P G	X	0.20	—
Acropolis	KDRI	—	Stephen D. Stephenidis	—	P G	X	—	—
Aculeo [7]	KEQQ	—	U.S. Shipping Board	—	P G	X	0.20	—
Acushnet [6]	NRU	75	Northern Michigan Transportation Co.	300, **600**	P G	N	0.20	—
Admiral Dewey [7]	WAY	100	Pacific S.S. Co.	300, **600**	P G	N	0.20 [11]	—
Admiral Evans [7]	KICZ	—	Pacific S.S. Co.	—	P G	X	0.20 [11]	—
Admiral Farragut [7]	WAF	100	Pacific S.S. Co.	300, 450, 515, **600**	P G	N	0.20 [11]	—
Admiral Goodrich [7]	WRJ	200	Pacific S.S. Co.	300, 440, 520, **600**	P G	N	0.20 [11]	—
Admiral Mayo [7]	WZIO	300	U.S. Shipping Board	300, 440, 525, **600**	P G	X	0.20 [11] 0.30 [13]	—
Admiral Nicholson [7]	KMAA	200	Pacific S.S. Co.	300, 450, **600**	P G	X	0.20 [11] 0.30 [13]	—
Admiral Rodman [7]	WOA	[illegible]	Seattle S.S. Co.	[illegible], **600**	P G	N	[illegible]	—

Remarks.

[3] Operated by the Independent Wireless Telegraph Company, 42, Broad way, New York (N.Y.)

[4] Operated by the International Radio Telegraph Company, 326, Broadway, New York (N.Y.)

[5] Operated by the Radio Corporation of America, Woolworth Building, New York (N.Y.)

[6] Operated by the owner

[7] Operated by the Ship Owners Radio Service, 149, Broadway, New York (N.Y.)

[8] Operated by the Tropical Radio Telegraph Company, 17, Battery Place, New York (N.Y.)

[9] Operated by the U.S. Naval Communication Service, Navy Department, Washington (D.C.)

[10] Private yacht

[11] When the ship is trading in the North and South American service

[12] When the ship is trading in the transoceanic service

[13] Operated by the Transmarine Corporation

Admiral Schley [7] ..	WAX	100	Pacific S.S. Co.	300, 600	P G ..	N	0.20 [11]	—
Admiral Sebree [7] ..	WAG	200	Pacific S.S. Co.	300, 600	P G ..	N	0.20 [11]	—
Admiral Sims [7] ..	KXUO	200	Pacific S.S. Co.	300, 440, 525, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Admiral Wainwright [7]	WSF	100	Pacific S.S. Co.	300, 450, 600	P G ..	X	0.20 [11]	—
Admiral Watson [7] ..	WAW	150	Pacific S.S. Co.	300, 450, 525, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Adria	KUSZ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Advance [6]	KMV	300	Panama R.R. Co.	300, 450, 600	P G ..	N	0.20 [11]	—
Adway [6]	WBEA	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Æolus KOZC [6] ..	KOZC	—	U.S. Shipping Board	—	P G ..	X	0.20	—
A. E. R. Schneider [6] ..	WFUI	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Afalkey [5]	WBEE	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Afel [5]	KISQ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Afoundria [7]	KOMG	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Afrania [5]	—	—		—	—	—	0.20	—
Atrinnia [5]	KLAI	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Agarista [5]	KLUU	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Agawam [5]	WNIE	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Agememnon [6]	KOXQ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Agria [7]	WQAI	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Agwidale [5]	WDOA	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Agwimars [5]	KDMC	—	Atlantic, Gulf and West Indies S.S. Lines	—	P G ..	X	—	—
Agwihavre [5]	KDRX	—	Atlantic, Gulf and West Indies S.S. Lines	—	P G ..	X	0.20	—
Agwilake [5]	KDNN	—	Atlantic, Gulf and West Indies S.S. Lines	—	P G ..	X	—	—
Agwisea [5]	KDMB	—	Atlantic, Gulf and West Indies S.S. Lines	—	P G ..	X	—	—
Agwismith [5]	KDRC	—	Atlantic, Gulf and West Indies S.S. Lines	—	P G ..	N	0.20	—
Agwistar KDPO [5] ..	KDPO	—	Atlantic, Gulf and West Indies S.S. Lines	—	P G ..	N	—	—
Agwistar KEPG [7] ..	KEPG	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Agwiworld [5]	KDMD	—	Atlantic, Gulf and West Indies S.S. Lines	—	P G ..	X	—	—
Ahala [5]	KECZ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Aiken [5]	WMUU	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Aimwell [7]	WVUO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Airlie [5]	WBEI	200	Nacirema S.S. Corpn.	300, 600	P G ..	X	0.20	—
Aisne KDNC	KDNC	—	U.S. Shipping Board	—	P G ..	N	0.20	—
Ajax KOJ [6] [10]	KOJ	—	Allessandro Favvri	—	P G ..	X	—	—
Ajax NAKD [9]	NAKD	—	Navy	300, 600	P G ..	N	0.20 [11]	—
Ala	KDOB	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Alabama WRAE [3] ..	WRAE	—	Texas Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Alabama NBI [9] ..	NBI	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Alabama WFB [6] ..	WFB	150	Goodrich Transit Co.	300, 600	P G ..	N	0.10	—
Alabat [7]	WSAO	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Aladdin KDQM ..	KDQM	—	Standard Transportation Co. ..	—	P G ..	X	—	—
Alameda NUGJ [9] ..	NUGJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
[illegible]meda WAA [7] ..	WAA	100	Alaska S.S. Co.	300, 600	P G ..	N	0.20 [11]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge.		Remarks.
							Per Word.	Minimum per Radio-telegram.	
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Alamo [6]	KEJ	200	Mallory S.S. Co.	300, 450 **600**	P G	N	0.20 [11] 0.40 [12]	—	
Alamosa [7]	WLUI	—	U.S. Shipping Board	—	P G	X	0.20	—	
Alanthus [5]	WVEE	—	U.S. Shipping Board	—	P G	X	0.20	—	
Alapaha [5]	WZAI	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Alaska WWS [7]	WWS	150	Alaska S.S. Co.	300, 435, 510, **600**	P G	N	0.20 [11] 0.30 [12]	—	
Alaskan [8]	WKA	200	Amer.-Hawaiian S.S. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Alba (El) [6]	KKL	200	Southern Pacific Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Albany [9]	NBJ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Albatross KELD [6]	KELD	150	Albatross Co.	300, **600**	P G	X	—	—	
Alberta KZA [6] [10]	KZA	200	F. Gilbern Bourne	300, **600**, 1,000	P G	X	0.20 [11] 0.40 [12]	—	
Albert E. Watts	KDOK	—	Sinclair Nav. Co.	—	P G	X	—	—	
Alcis [7]	KEPX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Alcona [7]	WLUO	—	U.S. Shipping Board	—	P G	X	0.20	—	
Alden [9]	NULK	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Alderman [5]	KIFF	—	U.S. Shipping Board	—	P G	X	0.20	—	
Alector [3]	KEPZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Aledo [5]	KEPL	—	U.S. Shipping Board	—	P G	X	0.20	—	
Alert NBL [9]	NBL	—	Navy	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Algic	KDDC	—	U.S. Shipping Board	—	P G	X	0.20	—	
Algonquin KDKH [6]	KDKH	300	Standard Transportation Co.	300, 450, **600**	P G	X	0.20	—	
Algonquin NRA [6]	NRA	—	U.S. Coastguard Dept.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Algorma [9]	NEVP	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Alicia KZB [6] [10]	KZB	60	Alfred I. Du Pont	300, **600**	P G	X	0.20 [11]	—	
A. L. Kent	KDLL	—	Crowell & Thurlow S.S. Co.	300, **600**	P G	X	—	—	
Allaguash [7]	KVX	500	American Transatlantic Co.	300, 450, 525, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Allegheny NACZ [9]	NACZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Allegheny WRAI	WRAI	—	Great Lakes Transit Corpn.	—	P G	X	[illegible]	—	

Allen	NJD	—	Navy	300, 600	P G ..	..		
							0.40 [12]	
Allentown[7]	KVIU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Allianca[6]	KMA	300	Panama R.R. Co.	300, 450, 600	P G ..	N	0.20	—
Alliance[5]	WRV	100	Gulf Mail S.S. Co.	300, 600	P G ..	X	0.20 [11]	—
							0.40 [12]	
Allies[5]	—	—	—	—	—	—	—	—
Allison[7]	WTOA	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Alloway[7]	KTAA	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Almirante (El)[5] ..	KKG	250	Southern Pacific Co.	300, 600	P G ..	X	0.20 [11]	—
							0.40 [12]	
Aloha[6 10]	KYH	200	A. C. James	300, 450, 600	P G ..	X	0.20	—
Alpace[5]	WBII	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Alpena[3]	WCS	100	Herbert C. Turner..	300, 500, 600	P G ..	X	0.10	—
Alta[6]	KICX	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Alvada[7]	WGEE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Amaranth[9]	NAPT	—	—	300, 600	P G ..	N	—	—
Ambridge[5]	KIKQ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
A. M. Byers[5]	WMY	100	North American S.S. Co. ..	300, 600	P G ..	X	0.10	—
Amcross[5]	KOVF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Amelia[5]	WRF	200	Atlantic Fruit Co.	300, 600	P G ..	X	0.20 [11]	—
							0.40 [12]	
America KDOW[5] ..	KDOW	—	U.S. Mail S.S. Co.	—	P G ..	X	0.20	—
American WKF[5] ..	WKF	200	American Hawaiian S.S. Co. ..	300, 600	P G ..	X	0.20 [11]	—
							0.40 [12]	
American Press[5] ..	KUDN	—	U.S. Shipping Board	—	P G ..	X	0.20	—
American Star[5] ..	KIPP	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Ammon NBP[9] ..	NBP	—	Navy	300, 600	P G ..	N	0.20	—
Amolco[6]	KMB	200	Boston Mollasses Co.	300, 450, 600	P G ..	X	0.20 [11]	—
							0.40 [12]	
Amoron[3]	WTOE	—	—	300, 600	P G ..	X	0.20	—
Ampetco[5]	KMAU	200	Standard Oil Co. of N.J. ..	300, 450, 600	P G ..	X	0.20 [11]	—
							0.40 [12]	
Amphion	WJS	200	U.S. Shipping Board Coastwise Trans. Co.	300, 600	P G ..	N	0.20	—
Anaconda[7]	KOFD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Anacortes[3]	KQOA	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Ancon[6]	KMS	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Andalusia[7]	WJA	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Andra[7]	WDEE	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Andrea F. Luckenbach[7]	KIFV	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Andrew Jackson[7] ..	KONQ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Androscoggin[6] ..	NRD	150	U.S. Coastguard Dept.	300, 600	P G ..	N	0.20 [11]	—
							0.40 [12]	
Anemone[9]	NABP	—	Navy	300, 600	P G ..	N	0.20 [11]	—
							0.40 [12]	
Angeles (Los)[1] ..	WOL	150	Union Oil Co. of California ..	300, 600, 1800	P G ..	X	0.20 [11]	—
							0.40 [12]	
Angelina[7]	KIFT	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Anima[3]	KROE	200	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Anna E. Morse ..	KUTD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Annapolis KDOM[6] ..	KDOM	—	City of Baltimore..	—	—	—	—	—
Annapolis NBR[9] ..	NBR	—	Navy	300, 600	P G ..	N	0.20 [11]	—
							0.40 [12]	
Ann Arbor No. 3 ..	WDN	125	Ann Arbor Rlrd. Co.	300, 600	P G ..	X	0.10	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Ann Arbor No. 4	WDO	125	Ann Arbor Rlrd. Co.	300, **600**	P G	X	0.10	—	
Ann Arbor No. 5	WDP	125	Ann Arbor Rlrd. Co.	300, **600**	P G	X	0.10	—	
Ann Arbor No. 6	WDQ	100	Ann Arbor Rlrd. Co.	300, **600**	P G	X	0.10	—	
Annetta [6]	WRG	—	Atlantic Fruit Co.	300, **6.0**	P G	X	0.20 [11] 0.40 [12]	—	
Annetta Rolph	KETZ	—	Rolph Nav. & Coal Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Anniston [3]	KIDM	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Anoka [6]	KOEE	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Anthera [5]	WNUA	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Anthony [9]	NEVS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Anthracite Bridge	KUKG	—	U.S. Shipping Board	—	P G	X	0.20	—	
Antietam [5]	KONR	—	U.S. Shipping Board	—	P G	X	0.20	—	
Antigone KOKN [3]	KOKN	—	U.S. Shipping Board	—	P G	X	0.20	—	
Antilla [3]	KWD	300	New York & Cuba Mail S.S. Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Antonia [6]	KOLO	—	Madrigal & Co.	—	—	—	—	—	
Aowa [5]	WRIA	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Apache KVA [6]	KVA	200	Clyde S.S. Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Apache NACB [6]	NACB	100	U.S. Coastguard Dept.	300, **600**	P G	N	0.20	—	
Apalachee [3]	WSAE	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Apex [6]	KGUI	150	Wilson Fisheries Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Aquarius	KUSN	—	Nafra Co., Incorp.	—	P G	—	—	—	
Aquilo KOCJ [6]	KOCJ	—	H. F. Alexander	300, **600**	—	—	—	—	
Arado [3]	WVUI	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Aragon KUKB	KUKB	—	The Aragon	—	P G	X	—	—	
Arambi [7]	KESF	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Aramis NARP [9]	NARP	—	—	300, **600**	P G	N	—	—	
Arapahoe [6]	KVB	200	Clyde S.S. Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Arbutus [6]	NAGM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Arcadia [5]	WWD	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Arcata [9]	NADD	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Archer [6]	KXG	300	U.S. Shipping Board	300, **600**	P G	N	[illegible]	—	

Arcturus NCO [9] ..	NCO	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Arden	KDPN	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Ardena KBEU [9] ..	KBEU	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Ardmore [5]	KIA	250	Standard Oil Co. of N.J.	300, 450, 00	P G ..	X	0.20 [11] 0.40 [12]	—
Arenas KIRM	KIRM	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Arethusa [9]	NBU	—	Navy	300, 600	P G ..	N	0.20	—
Argenta [7]	KIKS	—	—	300, 600	P G ..	X	0.20	—
Argon [6]	KUDD	—	Standard Transportation Co. ..	—	P G ..	X	—	—
Argonne [5]	KSIO	200	Argonne S.S. Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Argosy [7]	KDHL	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Argus KUVD [7] ..	KUVD	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Ario	KULM	—	Standard Transportation Co. ..	—	P G ..	X	—	—
Arizapa	KULN	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Arizona NBW [9] ..	NBW	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Arizona WFG [5] ..	WFG	150	Goodrich Transit Co.	300, 600	P G ..	X	0.10	—
Arizonan [5]	WKB	350	Amer. Hawaiian S.S. Co. ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Arkansas [9]	NBV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Armenia [5]	KYM	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Aroostook [9]	NMK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Artemis KDLJ [6] ..	KDLJ	—	J. M. Scott	—	—	X	—	—
Artemis WQS [5] ..	WQS	250	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Artigas [7]	KURG	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Arundel KETQ [7] ..	KETQ	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Aryan [5]	KOLB	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Asabeth [5]	KIXG	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Ascutney [5]	KYV	250	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Ashbee [5]	KIGZ	300	U.S. Shipping Board	3[illegible], 600	P G ..	X	0.20	—
Ashland County [6] ..	KONR	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Ashtabula WEZ [5] ..	WEZ	1[illegible]5	Penny. & Ontario Nav. Co. ..	300, 600	P G ..	X	0.10	—
Askawake [7]	KETM	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Asotin [7]	KILD	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Aspenhill [7]	KETR	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Asquam [6]	KISV	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Assinippi [6]	KIPB	—	U.S. Shipping Board	300, 00	P G ..	X	0.20	—
Astmahco III [7] ..	WBG	—	Astmahco No. 3 (Inc.)	300, 600	P G ..	X	0.20	—
Astmahco IV [7] ..	WDF	—	Astoria Mahogany Co.	300, 600	P G ..	X	0.20	—
Astoria KRIE [7] ..	KRIE	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Astral	KIQ	150	Standard Transportation Co. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Astrea KDOP [5] ..	KDOP	—	Davidson Chemical Co.	—	P G ..	X	0.20	—
Asuncion [5]	WTX	150	Standard Oil Co. of California ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Atenas [5]	KDK	500	United Fruit Co.	300, 600	P G ..	N	0.40	—
Atlanta of Texas ..	KDCN	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Atlantic NENN [9] ..	NENN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Atlantic Sun	KUMS	—	Sun Oil Company	—	P G ..	X	0.20	—	
Atlantus [9]	KIGN	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20 [11]	—	
Atlas [6]	WTT	150	Standard Oil Co. of California ..	300, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Auburn [5]	WDOE	150	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Auditor [7]	KOFF	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Auk [9]	NIJT	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Aulick [9]	NERG	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Ausable [7]	WWP	—	American Transatlantic Co. ..	300, **600**	P G ..	X	—	—	
Avalon WFH [6] ..	WFH	—	William Wrigley, Jnr.	—	P G ..	X	0.20	—	
Avalon KIZL [6] ..	KIZL	—	W. H. Wood	—	P G ..	X	0.20	—	
Avocet [9]	NADP	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Avondale [7]	KKAU	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Awonsdaw [6]	KEMC	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Aylwin [9]	NIH	—	Navy	300, **600**	P G ..	N	0.20	—	
Azalesa [9]	NXU	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Azatoa [6]	—	—	Immigration Service	—	—	—	—	—	
Babboosic [5]	KITC	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Babitt [9]	NEPX	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Baccarat KUSX ..	KUSX	—	Independent S.S. Co.	—	P G ..	X	—	—	
Bacoi [5]	KJU	200	U.S. Shipping Board	300, 450, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Baddacock [1]	KUJD	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Badger [9]	NEPT	—	Navy	300, **600**	P G ..	N	0.20 [1] 0.40 [12]	—	
Bagaduce [9]	NAZP	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Baganito [7]	KGB	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Bagley [9]	NVU	—	—	300, **600**	P G ..	N	0.20 [11] 0.10 [12]	—	
Bagose [7]	WSAU	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Bailey [9]	NCF	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Bakersfield [9]	KIZC	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	

Name	Call		Owner			Wave lengths	Service			Rate	
Baladan [8]	KVEU	200	U.S. Shipping Board	..	..	300 475, 600	P G	..	X	0.20	—
Balcatta [6]	KOLM	—	U.S. Shipping Board	..	..	—	P G	..	X	0.20	—
Balch [9]	NII	—	Navy	..	..	300, 600	P G	..	N	0.20 [11] 0.40 [11]	—
Baldbutte [8]	KISM	—	U.S. Shipping Board	..	..	300, 600	P G	..	N	0.20	—
Baldhill [7]	KOBV	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Baldridge [6]	KEQG	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Baldrock [7]	KEQJ	150	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Ballard [9]	NIGN	—	Navy	..	..	300, 600	P G	..	N	0.20 [11] 0.40 [12]	—
Ballcamp [6]	KENV	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Ballenas [7]	KEMZ	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Ballew [7]	KENQ	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Balliott [6]	KVIA	200	U.S. Shipping Board	..	..	300, 476, 600	P G	..	X	0.20	—
Balosaro [8]	KEDB	200	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Balsam [8]	KIJC	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Balsto [8]	WPAA	—	U.S. Shipping Board	..	..	300, 00	P G	..	X	0.20	—
Baltimore [9]	NCH	—	Navy	..	..	300, 600	P G	..	N	0.20 [11] 0.40 [12]	—
Banago [8]	WVEO	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Banaran [7]	KENZ	—	U.S. Shipping Board	..	..	300, 600	P G	..	N	0.20	—
Bancroft KNOI [8] ..	KNOI	200	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Bancroft NAJQ [9] ..	NAJQ	—	Navy	..	..	300, 600	P G	..	N	0.20 [11] 0.40 [12]	—
Banicaa..	KEQF	—	—			—	—		—	—	—
Bannask [6]	KIZQ	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Bantu [6]	KLM	200	U.S. Steel Products Co.	..	..	300, 600	P G	..	X	0.20	—
Bar Harbor [8]	KEFD	200	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Barker [9]	NUJK	—	Navy	..	..	300, 600	P G	..	N	0.20 [11] 0.40 [8]	—
Bark Hamstead [7] ..	WLOU	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Barlow [6]	WLAE	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Barney [9]	NVV	—	Navy	..	..	300, 600	P G	..	X	0.20 [11] 0.40 [12]	—
Barrallton [8]	KIDT	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Bar anca KIFR [7] ..	KIFR	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Barrenfark [8]	KIJD	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Barrington [8]	KJIA	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Barryton [7]	KIJF	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Barstow [8]	KIJR	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Barthney [6]	KIZD	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Bartolome [6]	KOBS	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Bartholomew [6] ..	KOMF	—	U.S. Shipping Board	..	..	—	P G	..	X	0.20	—
Barugo [6]	KEQC	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Barwick [6]	KOBR	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Basco [6]	WVEI	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Bascobel [8]	KOFS	—	U.S. Shipping Board	..	..	—	P G	..	X	0.20	—
Basford [6]	KOFR	—	U.S. Shipping Board	..	..	—	P G	..	X	0.20	—
Batanes [8]	KEKX	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Bath [9]	NHY	—	Navy	..	..	300, 600	P G	..	N	0.20 [11] 0.40 [12]	—
Bathalum [8]	KIQT	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Bathgate [6]	KIQS	—	U.S. Shipping Board	..	..	300, 600	P G	..	X	0.20	—
Baton Rogue [6] ..	KSG	200	U.S. Shipping Board	..	..	300, 450, 600	P G	..	X	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Battahatchee [5]	WCOA	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Battonville [5]	KIGV	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bavington [5]	KOPC	—	U.S. Shipping Board	—	P G	X	0.20	—	
Baxley [5]	WBIO	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bayamo [5]	WD U	200	U.S. Shipping Board	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Bay Head [5]	KINT	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bayou Chico	KDGK	—	U.S. Shipping Board	—	P G	X	0.20	—	
Bayou Teche [5]	WXUU	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bayport	KUJC	—	U.S. Shipping Board	—	P G	X	0.20	—	
Bayside	KDDX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Bayspring	KDDW	—	U.S. Shipping Board	—	P G	X	0.20	—	
Baytown [5]	KDEM	—	Humble Oil and Refining Co.	—	P G	X	—	—	
Bayway [5]	KSR	200	Standard Oil Co. of N.J.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Beale [9]	NCL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Bear [4]	NRB	150	U.S. Coastguard Dept.	300, **600**	P G	N	0.20	—	
Bearport [7]	KUBK	—	U.S. Shipping Board	—	P G	X	0.20	—	
Beatrice [5] [11]	KLJ	200	A. H. Bull S.S. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Beaufort NGP [9]	NGP	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Beaumont [5]	WXUA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Beaver NEQQ [9]	NEQQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Bedminster [5]	WQIE	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Belair [5]	WTOI	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Belamquan	WPEA	—	—	300, **600**	P G	X	0.20	—	
Belding [5]	KPUE	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Belfast [5]	KRD	200	Eastern S.S. Lines	300, **600**	P G	X	0.20 [11]	—	
Belfort KIQB [6]	KIQB	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Belknap [9]	NEZZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Bell [9]	NATG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Bella	WAX	—	—	—	—	—	—	—	
Bell Brook [6]	KQEI	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bellbuckle [6]	KITK	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	

Belleplaine [7]	KOKF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Bellerose [6]	KOKD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Bellflower [3]	KOPQ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Bellhaven [7]	KOFC	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Bellingham [3]	WCIA	300	U.S. Shipping Board	300, 600	P G ..	X	0.2[illegible]	—
Bellota [7]	KVEA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Beloit [6]	KNIO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Belvidere [7]	KEQK	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Benjamin Brewster [6] ..	KFS	250	Standard Oil Co. of N.J.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Benj. F. Panchard [7] ..	WLA	100	Nacirema S.S. Corpn.	300, 450, 525, 600	P G ..	X	0.20 [11]	—
Benkam [9]	NIJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Benoni [3]	KERR	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Benowa [6]	KOTZ	—	J. E. Chilberg	—	P G ..	X	0.20	—
Bensalem [3]	KOFT	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Benzonia [3]	KPUO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Berea [3]	KELJ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Berela [6]	KEKF	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Berlin WRB [3]	WRB	200	U.S. Shipping Board	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Bernadon [9]	NESS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Bessemer [6]	KIGT	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Bessemer City [6] ..	KDOF	—	U.S. Steel Products Co.	—	P G ..	N	0.20	—
Bethelridge [6]	KERT	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Bethlehem Bridge [7] ..	KIJV	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Bethnor [9]	KOKT	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Betsy Bell [3]	KITM	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Betterton [7]	KUBG	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Bibbco	KDHJ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Biddle [9]	NVW	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Bidwell [7]	KESQ	—	U.S. Shipping Board	—	—	—	—	—
Billingsley	NUPQ	—	U.S. Navy	300, 600	P G ..	N	—	—
Biloxi [7]	KPAI	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Biran [3]	KKOA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Birchleaf KEMD [6] ..	KEMD	200	U.S. Shipping Board	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Bird City [3]	KOBP	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Birmingham NCN [9] ..	NCN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Birmingham City [6] ..	KUTT	—	U.S. Steel Products Co.	—	P G ..	—	0.20	—
Bittern [9]	NIJR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Black Arrow [7] ..	WLN	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Black Hawk [9]	NAJD	—	Navy	300, 600	P G ..	N	0.20 0.40 [12]	—
Blair [6]	KIGR	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Blakeley [6]	WNUE	200	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Blakely [9]	NVX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Blandon [3]	KPAU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Blue Eagle [5]	KPOA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Blue Point	KDLU	—	Atlantic Fisheries Co.	—	—	X	—	—	
Blue Triangle [5]	KUGS	—	U.S. Shipping Boad	—	P G	X	0.20	—	
Bluffton [6]	KEKZ	—	U.S. Shipping Board	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Blythedale [7]	KROA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bobolink [9]	NIJJ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Bobring [7]	WCAA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bockonoff [5]	WNUI	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Boggs [9]	NAMT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Boilston [7]	KPEA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bolikow [8]	KEQD	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bologan [7]	WLIU	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bonita [6]	KFT	—	T. A. Scott Co. (Incorp.)	300, **600**	P G	X	0.15	—	
Bonnafon [8]	KNOU	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bonneteere [7]	KETL	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Bonnie Brook	KDGX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Bon Secour [7]	KIKV	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Boobyalla	KUGC	—	J. E. Chilberg	—	—	—	—	—	
Boone [7]	KENL	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Borad [8]	KIDK	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Borges [6]	WKEU	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Borie [9]	NULL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Boston KXA [4]	KXA	50	New England S.S. Co.	300, **600**	P G	N	0.15	—	
Boston KXS [8]	KXS	200	U.S. Shipping Board	300, **600**	P G	X	0.20 [11]	—	
Boston NGC [9]	NGC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Boston Bridge [5]	KINS	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bothwell	NEKD	—	U.S. Navy	300, **600**	P G	N	—	—	
Botsford [8]	WZAO	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bottineau [5]	WCAE	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Boulton [7]	KNOE	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bound Brook [7]	KIFQ	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Boxbutte [8]	KETS	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Boxley [7]	KNUU	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Boyce	NISD	—	U.S. Navy	300, **600**	P G	N	—	—	

Boykin [7]	KETT	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Boynton [6]	KUGF	—	U.S. Shipping Board	—	P G	X	0.20	—
Brabant KUU [6]	KUU	200	Alaska S.S. Co.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Braddock [5]	KETG	—	U.S. Shipping Board	—	P G	N	0.20	—
Bradford [6]	KNG	300	Standard Oil Co. of N.J.	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Braeburn [5]	WMOI	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Bramell Point [6]	KRO	150	U.S. Shipping Board	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Branch [9]	NEML	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Brandywine [7]	WGUI	200	Florida E. Coast Car Ferry Co.	300, 600	P G	X	0.20	—
Brant KUDB [6]	KUDB	—	East Coast Fisheries Co.	—	P G	X	—	—
Brant NAFF [9]	NAFF	—	Navy	300, 600	P G	N	0.20 [11] 0.10 [12]	—
Brasher [9]	KIJX	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Brave Coeur [6]	KOGN	—	U.S. Shipping Board	—	P G	X	0.20	—
Braxton [3]	KIBS	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Brea (La) [1]	WON	300	Union Oil Co. of California	300, 600, 1,800	P G	X	0.20 [11] 0.40 [12]	—
Breck [9]	NULZ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Breckinridge [9]	NERZ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Breese [9]	NESM	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Bremerton [9]	WSZ	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Brevard [6]	KEPJ	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Briarcliff [6]	KEPK	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Bridge [9]	NOI	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Bridgeport [9]	NGR	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Brilliant [5]	KTI	200	Standard Oil Co. of N.Y.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Brindilla [5]	KTZ	300	Standard Oil Co. of N.J.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Bristol	KEGC	—	Coastwise Transportation Co.	—	—	—	—	—
Broad Arrow [5]	KSY	300	Standard Transportation Co.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Brockton [4]	KNH	50	Colonial Nav. Co.	300, 600	P G	N	0.15	—
Bromela [5]	KRAI	200	U.S. Shipping Board	300, 600	P G	N	0.20	—
Brompton [5]	KRAO	200	U.S. Shipping Board	300, 600	P G	N	0.20	—
Bronche [5]	KRAU	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Brookdale [7]	WNUO	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Brookline [7]	KURT	—	U.S. Shipping Board	—	P G	N	0.20	—
Brooklyn [9]	NFA	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Brooks [9]	NEZX	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Brookwood [6]	KRUE	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Broome [9]	NEPF	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Bruce NUPS	NUPS	—	U.S. Navy	300, 600	P G	N	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Brush [7]	KDHV	300	U.S. Shipping Board	300, 450, **600**	P G	X	0.20	—	
Brutus [9]	NNA	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Brynhilda [5]	KIO	200	Brynhilda Shipping Corpn.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Buccaneer [5]	KFO	150	Freeport & Tampico Fuel Oil Trans. Corpn.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Buchanan [9]	NEQS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Buchannon [7]	KELG	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Buckeye State	KDRW	—	U.S. Shipping Board	—	P G	N	0.20	—	
Buckhorn [3]	WXIO	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Buffalo [9]	NCU	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Buffalo Bridge [6]	KIZF	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Buford WXA [6]	WXA	300	U.S. Signal Corps	300, **600**	P G	N	0.20 [11]	—	
Bugaya [5]	WQOU	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Buhisan [7]	WVII	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bulana [7]	WJUU	150	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bulmer	NUPN	—	U.S. Navy	300, **600**	P G	N	—	—	
Burns [9]	NAFZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Burnside WXR [6]	WXR	100	U.S. Signal Corps	300, **600**	P G	—	—	—	
Burnwell [5]	KIMS	—	—	300, **600**	P G	X	—	—	
Burrows [9]	NCV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Bush [9]	NETT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Bushnell [9]	NZC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Bushrod [7]	—	—	—	—	—		—	—	
Butte [7]	—	—	—	—	—	—	—	—	
Buttercup [8]	KIJT	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Butterfield [7]	KIJS	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Byfield [7]	KIBZ	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Bylayl [6]	KSOU	—	Petroleum & Transport Co.	—	—		—	—	
C.1 NXK	NXK	—	U.S. Navy	300, **600**	P G	N	—	—	
C.4 NXN	NXN	—	U.S. Navy	300, **600**	P G	N	—	—	
Cabegon [9]	KEJQ	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	

Cabeza [6]	KKEA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Cabrille [6]	KENS	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Cabrillo [6]	WBV	150	Wilmington Transport Co. ..	300, 600	P G ..	X	0.05	—	
C. A. Canfield [6] ..	WIH	300	Pan-Amer. Petrol. & Trans. Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Cacquei [1]	WBE	—	Grace S.S. Co.	300, 600, 1,800	P G ..	X	0.20 [11] 0.40 [12]	—	
Cadaretta [7]	WLOO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Caddo [5]	KSK	300	Standard Oil Co. of N.J.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Caddopeak [8]	WPUE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Caesar [9]	NCY	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Cairo KDQW	KDQW	—	Marietta Manufacturing Co. ..	—	—	—	—	—	
Calala [3]	KQAO	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Calamares [8]	KLC	500	United Fruit Co.	300, 600	P G ..	N	0.40		
Caldas [6]	KOQV	—	Caribbean S.S. Co.	—	P G ..	X	0.20	—	
Caldwell [9]	NSI	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Calicorock [8]	KXII	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
California NDF [9] ..	NDF	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Calispell [6]	KXIO	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Callabasas [8]	WPUI	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Callao WHF [8]	WHF	150	Garland S.S. Corpn.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Calno [8]	KINV	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Caloria [8]	KSP	300	Standard Oil Co. of N.J.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Calvert [8]	WTUI	300	U.S. Shipping Board	300, 600	P G ..	X	0.20		
Calvin Austin [5] ..	KRN	200	Eastern S.S. Lines	300, 600	P G ..	N	0.20	—	
Camaguey [3]	KWI	300	New York & Cuba Mail S.S. Co.	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Cambrai KDJN ..	KDJN	—	U.S. Shipping Board	—	P G ..	N	0.20	—	
Cambridge KGR [4] ..	KGR	50	New York & New Orleans S.S. Co.	300, 550, 600	P G ..	N	0.15	—	
Cambridge KIRR [8] ..	KIRR	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Camden KRC [5] ..	KRC	200	Eastern S.S. Lines	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Camden KDKL [6] ..	KDKL	—	Atlantic Fruit Co.	—	P G ..	—	0.40	—	
Camden NAPR [9] ..	NAPR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Campello [6]	WTAU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Canandaigua [6]	NCR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Canco [6]	KUTP	—	American Can Co.	—	P ..	X	—	—	
Canibas [8]	WOEU	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Canoga [7]	WKZ	250	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Canonicus [8]	NCS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Cansumset	KIOD	—	—	300, 600	P G ..	X	0.20	—	
Cantigny	KDFO	—	U.S. Shipping Board	—	P G ..	—	0.20	—	
Cape Henry [7]	KMIE	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Cape May [8]	WDOI	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Cape Romain [8]	KREA	100	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Capillo	KUPM	—	U.S. Shipping Board	—	P G ..	X	0.20	—	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Capines[8]	KSAI	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Capital of Nebraska	KUSF	—	U.S. Shipping Board	—	P G	X	0.20	—	
Caponka[7]	WCAO	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Captain (El) KKH[8]	KKH	200	Southern Pacific Co.	300, 450, **600**	P G	X	0.20[11] 0.40[12]	—	
Captain (El) WNB[8]	WNB	300	Standard Oil Co. of N.J.	300, 450, **600**	P G	X	0.20[11] 0.40[12]	—	
Captain A. F. Lucas[8]	WTV	150	Standard Oil Co. of California	300, 450, **600**	P G	X	0.20[11] 0.40[12]	—	
Captain A. M. Wetherill[9]	WYT	—	U.S. Coastguard Dept.	400	O	X	—	—	
Captain Charles W. Rowell[9]	WYI	—	U.S. Coastguard Dept.	400	O	X	—	—	
Captain Clarence M. Condon[9]	WYBY	—	—	300, **600**	P G	N	—	—	
Captain Edwin C. Long[9]	WYBO	—	—	300, **600**	P G	N	—	—	
Captain Fred L. Perry[9]	WYBN	—	—	300, **600**	P G	N	—	—	
Captain Gregory Barrett[9]	WYP	—	U.S. Coastguard Dept.	400	O	X	—	—	
Captain James Fornance[9]	WYM	—	U.S. Coastguard Dept.	400	O	X	—	—	
Captain Samuel C. Cardwell[9]	WYBM	—	—	300, **600**	P G	N	—	—	
Captain T. M. Morrison[9]	WYZ	—	U.S. Coastguard Dept.	1,200	O	X	—	—	
Captain Edward P. Nones[9]	WYBP	—	—	300, **600**	P G	N	—	—	
Caracas[8]	KDB	200	U.S. Shipping Board	300, 450, **600**	P G	N	0.20[11] 0.40[12]	—	
Cardinal[9]	NAFN	—	Navy	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Carenco	KDDM	—	U.S. Shipping Board	—	P G	X	0.20	—	
Carib KJIU[8]	KJIU	—	Atlantic Gulf & W. Indies S.S. Lines	—	—	—	—	—	
Caribbean	KGUE	—	—	—	—	—	—	—	
Caribou[8]	WSIA	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Carillo[8]	KDE	500	United Fruit Co.	300, **600**	P G	N	0.40	—	
Carl D. Bradley[8]	WGN	100	Bradley Transportation Co.	300, 425, 540, **600**	P G	X	0.10	—	
Carlton	KDDK	—	U.S. Shipping Board	—	P G	X	0.20	—	
Carola IV[9]	NNO	—	Navy	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Carolina WFE[8]	WFE	100	Goodrich Transit Co.	300, **600**	P G	X	0.10	—	

Carolinian[7]	KJF	200	Garland S.S. Corporation	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Carolyn[8]	KZG	200	A. H. Bull S.S. Co.	300, 600	P G	X	0.20 [11] 0.40 [10]	—
Carplake	KDES	—	U.S. Shipping Board	—	P G	X	0.20	—
Carr[9]	NEXP	—	—	300, 600	P G	N	—	—
Carrabasset[9]	NEVQ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Carrabulle	KDER	—	U.S. Shipping Board	—	P G	X	0.20	—
Cartago[8]	KDD	500	United Fruit Co.	300, 600	P G	N	0.40	—
Cartona[6]	KUFL	—	U.S. Shipping Board	—	P G	X	0.20	—
Cascade[8]	WPUO	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Casco[8]	WCP	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Case[8]	NUNX	—	—	300, 600	P G	N	—	—
Casey[8]	KOQJ	—	U.S. Shipping Board	—	P G	X	0.23	—
Casiana[10]	KYE	150	Edward L. Doheny	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Casmalia[7]	WSII	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
C. A. Smith[6]	WEL	—	Coos Bay Lumber Co.	—	—	—	—	—
C. A. Snider[8]	KRR	250	Vacuum Oil Co. (N.Y.)	300, 450, 600	P G	X	0.20	—
Casper[8]	KIRX	—	U.S. Shipping Board	300 600	P G	X	0 20	—
Cassimir	KDDZ	—	U.S. Shipping Board	—	P G	X	0.20	—
Cassin[9]	NIK	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Castana	KDFF	—	U.S. Shipping Board	—	P G	X	0.20	—
Castle Point[8]	KESD	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Castle Town[8]	KOF	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Castle Wood[7]	KEKQ	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Catahoula	KDFG	—	U.S. Shipping Board	—	P G	X	0.20	—
Catawba[8]	KVEE	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Catherine[7]	KTOI	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Catherine D.[7]	KMAI	500	Pacific Amer. Fisheries	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Cathlamet[8]	KOLP	—	U.S. Shipping Board	—	P G	X	0.20	—
Cathwood[8]	KURC	—	U.S. Shipping Board	—	P G	X	0.20	—
Cauto[8]	KWF	300	N.Y. & Cuba Mail S.S. Co.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Cawker[8]	KECF	200	U.S. Shipping Board	300, 600	P G	N	0.20	—
Cayuga KDJQ	KDJQ	—	Indepent S.S. Co.	—	P G	X	—	—
Cayuga NAFP[8]	NAFP	—	Navy	300, 600	P G	N	0.20	—
Cebu	KDOC	—	Compania Maritima	—	—	—	—	—
Cecil County[8]	—	—	—	—	—	—	—	—
Cedar[6]	NLW	—	Bureau of Lighthouses	—	—	—	—	—
Cedarhurst	KDIQ	—	U.S. Shipping Board	—	P G	X	0.20	—
Cedar Spring[8]	WTEE	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Celilo[8]	WMF	200	U.S. Shipping Board	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Celtic NDB[9]	NDB	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Centaurus[6]	KOPZ	—	Nafra Co., Incorp.	—	P G	X	0.20	—
Centennial State	KDRL	—	U.S. Shipping Board	—	P G	N	0.20	—
Central American[9]	WKOU	—	Texas Company	—	—	—	0.20 [11] 0.40 [12]	—
Ceralvo[7]	WTEI	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Cerosco[8]	WTEO	200	U.S. Shipping Board	300, 600	P G	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Cerrito [6]	WFIU		U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Cerro-Azul	KDQY	—	Pan-American Petroleum and Transport Co., Inc.	—	P G	X	—	—	
Cerro-Ebano	KDQS	—	Pan-American Petroleum and Transport Co., Inc.	—	P G	N	—	—	
Cerro Gardo [7]	KEFK	—	—	300, **600**	P G	X	0.20	—	
Cethana [6]	KORG	—	J. E. Chilberg	—	P G	X	0.20	—	
Challamba [8]	KORJ	—	J. E. Chilberg	—	P G	X	0.20	—	
Challenger [8]	WNII	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Chalmette [5]	KKC	300	Southern Pacific Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Chamberino [7]	KEFL	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Chamblee [7]	KEGG	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Champlin [9]	NEKQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Chandler [9]	NAGL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Chantier [6]	KEGK	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Chaparel [6]	KEGJ	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Chappaqua	KURF	—	U.S. Shipping Board	—	P G	X	0.20	—	
Chappell [8]	KEVS	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Charles Ausburne [9]	NUPR	—	—	300, **600**	P G	N	—	—	
Charles Braley [5]	KVP	200	American-Italian Comm. Corpn.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Charles E. Harwood [5]	WID	300	Pan-Amer. Petroleum & Transport Co.	300, 450, **600**	P G	X	0.20	—	
Charles H. Cramp	KDHH	—	U.S. Shipping Board	—	P G	N	0.20	—	
Charles L. Hutchinson [5]	WMIU	150	Canada S.S. Lines, Montreal	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Charles M. Everest	WPOU	—	Vacuum Oil Co.	—	—	—	—	—	
Charles O. Jenkins [5]	WFT	100	Detroit & Cleveland Nav. Co.	300, 450, **600**	P G	X	0.10	—	
Charles Pratt [5]	KSQ	300	Standard Oil Co. of N.J.	300, 450, **600**	P G	X	0,20 [11] 0,40 [12]	—	
Charles S. Osbourne [9]	NABG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Charleston [9]	NFE	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Charlie Watson	KDLA	—	Standard Oil Co.	—	P G	X	—	—	
Charlot [9]	WMUI	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	

							0.40 [12]	
Chase [9]	NUMK	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Chateau Thierry	KDKE	—	U.S. Shipping Board	—	P G	N	0.20	—
Chattanooga KIDN [5]	KIDN	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Chattanooga NGI [9]	NGI	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Chaumont	KDLI	—	U.S. Shipping Board	—	P G	N	0.20	—
Chauncey [9]	NIF	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Chautaugua [5]	KIFK	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Chebaulip [5]	KJAA	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Chemung [9]	NARG	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Chepadoa [5]	KOFL	—	U.S. Shipping Board	—	P G	X	0.20	—
Cherokee [5]	KVK	200	Clyde S.S. Co.	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Cheron [3]	KNII	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Chester [9]	NDG	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Chester Sun [5]	WAS	150	Sun Company	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Chester Valley [7]	KOST	—	U.S. Shipping Board	—	P G	X	0.20	—
Chester W. Chapin [4]	KXQ	50	New England S.S. Co.	300, 550, 600	P G	N	0.15	—
Chestnut Hill [7]	KVG	200	U.S. Shipping Board	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Chetopa [7]	KCAE	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Chew [9]	NEMZ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Chewink [9]	NIJV	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Cheyenne NDH [9]	NDH	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Chibiabos [7]	WPOE	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Chicago NDI [9]	NDI	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Chicago WAC [7]	WAC	100	Booth Fisheries Co.	300, 600	P G	X	0.20	—
Chicago Bridge [7]	KECG	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Chickamauga [5]	KULC	—	U.S. Shipping Board	—	P G	X	0.20	—
Chickasaw [3]	KOJR	—	U.S. Shipping Board	—	P G	X	0.20	—
Chickasaw City	KUNZ	—	U.S. Steel Products Co.	—	P G	N	—	—
Chicomico [5]	KOLS	—	U.S. Shipping Board	—	P G	X	0.20	—
Childs [9]	NULN	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
China WWA [5]	WWA	150	Kerr Nav. Corpn.	300, 600	P G	N	0.20 [11] 0.40 [12]	—
China Arrow	KDGW	—	Standard Transportation Co., N.Y.	—	P G	N	—	—
Chincha [5]	KJZ	300	Nafra Company	300, 450, 600	P G	N	0.20 [11] 0.40 [12]	—
Chipchung [3]	WBIA	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Chippewa KDJS [5]	KDJS	150	Independent S.S. Co.	300, 600	P G	X	0.20	—
Christabel	KUTN	—	Savannah Bar Pilots	—	P G	X	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Christopher Columbus [5]	WFJ	150	Goodrich Transit Co.	300, **600**	P G	X	0.10	—	
Cid (El) KKT [5]	KKT	200	Southern Pacific Co.	300, 450, **600**	P G	X	0.20	—	
Cigarette	KDQQ	—	—	—	—	—	—	—	
Cincinnati [9]	NISN	—	—	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Cineas	KEXP	—	—	300, **600**	P G	X	0.20	—	
Circinus	KOPK	—	Nafra Co., Incorp.	—	P G	X	0.20	—	
City of Alameda [7]	KUCQ	—	U.S. Shipping Board	—	P G	X	0.20	—	
City of Alma [7]	KUBP	—	U.S. Shipping Board	—	P G	X	0.20	—	
City of Alpena II [6]	WEH	125	Detroit and Cleveland Nav. Co.	300, **600**	P G	X	0.10	—	
City of Alton [7]	KONZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
City of Atlanta [5]	KFB	200	Ocean S.S. Co. of Savannah	300, 450, **600**	P G	N	0.20[11] 0.40[12]	—	
City of Augusta [5]	KFJ	300	Ocean S.S. Co. of Savannah	300, 450, **600**	P G	N	0.20[11] 0.40[12]	—	
City of Bangor [5]	KRH	200	Eastern S.S. Lines	300, **600**	P G	X	0.20[11] 0.40[12]	—	
City of Benton Harbor [5]	WDV	150	Graham & Morton Trans. Co.	300, **600**	P G	X	0.10	—	
City of Berkeley [5]	KOZQ	—	U.S. Shipping Board	—	P G	X	0.20	—	
City of Brockton [4]	KXO	—	New England S.S. Co.	300, **600**	—	—	—	—	
City of Brunswick	KDNQ	—	U.S. Shipping Board	—	P G	X	0.20	—	
City of Buffalo [5]	WFQ	100	Cleveland & Buffalo Trans. Co.	300, **600**	P G	X	0.10	—	
City of Cleveland III [5]	WEA	125	Detroit & Cleveland Nav. Co.	300, **600**	P G	N	0.10	—	
City of Columbus [5]	KFA	200	Ocean S.S. Co. of Savannah	300, 450, **600**	P G	N	0.20[11] 0.40[12]	—	
City of Dalhart	KDNP	—	U.S. Shipping Board	—	P G	X	0.20	—	
City of Detroit II [6]	WEC	125	Ocean S.S. Co. of Savannah	300, 450, 500, **600**	P G	N	0.10	—	
City of Detroit III [5]	WEF	125	Ocean S.S. Co. of Savannah	300, **600**	P G	N	0.10	—	
City of Elwood	KDMV	—	U.S. Shipping Board	—	P G	X	0.20	—	
City of Erie [5]	WFP	100	Cleveland & Buffalo Transit Co.	300, **600**	P G	X	0.10	—	
City of Eureka [5]	KEFT	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
City of Everett [8]	KTQ	250	Standard Transportation Co.	300, **600**	P G	X	0.20	—	
City of Fairbury [7]	KISR	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
City of Flint [7]	KUCV	—	U.S. Shipping Board	—	P G	X	0.20	—	
City of Freeport [8]	KESV	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
City of Grand Rapids [5]	WDS	100	Graham & Morton Trans. Co.	300, **600**	P G	X	0.10	—	
City of Joliet	[illegible]	[illegible]	U.S. Shipping Board	[illegible]	P G	X	[illegible]	[illegible]	
City of [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	P G	X	[illegible]	[illegible]	

City of Lowell [4] ..	KNB	50	New England S.S. Co.	300, 550, 600	P G ..	N	0.15	
City of Mackinac II [6] ..	WEB	125	Detroit & Cleveland Nav. Co. ..	300, 600	P G ..	X	0.10	—
City of Miami [7] ..	WDI	—		—	P G ..	X	—	—
City of Montgomery [6] ..	KFY	300	Ocean S.S. Co. of Savannah ..	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
City of Omaha [6] ..	KOZB	—	U.S. Shipping Board	—	P G ..	X	0.20	—
City of Para [1] ..	WWF	—	Pacific Mail S.S. Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
City of Puebla [6] ..	WGQ	200	Puebla S.S. Corporation ..	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
City of Rayville ..	KDCS	—	U.S. Shipping Board	—	P G ..	X	0.20	—
City of Reno [7] ..	KUSK	—	U.S. Shipping Board	—	P G ..	X	0.20	—
City of Rockland [5] ..	KRI	200	Eastern S.S. Lines	300, 600	P G ..	X	0.20	—
City of Rome [6] ..	KQZ	200	Ocean S.S. Co. of Savannah ..	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
City of Savannah [6] ..	KFK	200	Ocean S.S. Co. of Savannah ..	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
City of Seattle [6] ..	WGA	100	Pacific Coast Co.	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
City of Sherman ..	KUCS	—	U.S. Shipping Board	—	P G ..	X	0.20	—
City of Spokane [7] ..	KILL	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
City of St. Ignace [6] ..	WEG	125	Detroit & Cleveland Nav. Co. ..	300, 600	P G ..	X	0.10	—
City of St. Joseph [3] ..	KOSM	—	U.S. Shipping Board	—	P G ..	X	0.20	—
City of St. Louis [6] ..	KFZ	300	Ocean S.S. Co. of Savannah ..	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
City of Sydney [6] ..	KKEI	—	L. A. Pederson	—	—	—	—	—
City of Taunton [4] ..	KXL	50	Newington S.S. Co.	300, 550, 600	P G ..	N	0.15	—
City of Vernon ..	KUNS	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Clackamas [6]	KQEA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Clairton [6]	KIKR	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Clare [6]	KNE	200	A. H. Bull S.S. Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Claremont [6]	KUBD	—	W. H. Hood	—	P G ..	X	—	—
Clark Mills [3]	KOCQ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Clarksburg [6]	KOVP	—	Coastwise Transportation Co. ..	—	P G ..	X	0.20	—
Clauseus [5]	—	—	—	—	—	—	0.20	—
Clavarack [5]	KOLL	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Claxton [9]	NEQZ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Clearwater [6]	KUGD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Clemence C. Morse [6] ..	KUGG	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Clemens A. Reiss [6] ..	WNH	200	Reiss S.S. Co.	300, 600	P G ..	X	0.10	—
Clement Smith ..	KDGO	—	—	—	P G ..	—	—	—
Celmson [9]	NEZT	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Cletus Schneider [6] ..	KMEO	175	U.S. Shipping Board	300, 600	P G ..	X	0.10	—
Cleveland [9]	NDM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Cliffwood [7]	KORX	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Clincho [6]	KENX	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Clio KIKZ [6]	KIKZ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Clodia [6]	KILB	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Clontarf [7]	KUDP	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Coahoma County [7] ..	KOMP	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Coalinga [1]	WOT	150	Union S.S. Co.	300, 600, 1,800	P G ..	X	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Coamo [5]	KGA	200	N.Y. & Porto Rico S.S. Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Coastwise	KUZ	—	Neptune Line	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Coaxet [3]	WPUU	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Cochin [6]	KELR	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Cockaponset [7]	KOFN	—	U.S. Shipping Board	—	P G	X	0.20	—	
Coconino [5]	WMIA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Cody	KDEX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Coelleda [5]	KOVV	—	U.S. Shipping Board	—	P G	X	0.20	—	
Cœur d'Alene [7]	KOVT	—	U.S. Shipping Board	—	P G	X	0.20	—	
Coghian [6]	NUPK	—	—	300, **600**	P G	N	—	—	
Cohasset [7]	WJUI	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Cokato [3]	WMUE	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Cokesit [3]	WQUA	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Coldbrook [6]	KOQK	—	U.S. Shipping Board	—	P G	X	0.20	—	
Cold Harbor [7]	KUBB	—	U.S. Shipping Board	—	P G	X	0.20	—	
Cold Spring [6]	KIQK	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Coldwater [7]	KUCX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Cole [6]	NEST	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Col. E. L. Drake [6]	WTS	150	Standard Oil Co. of California	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Colonel Garland N. Whistler [6]	WYBJ	—	—	300, **600**	P G	N	—	—	
Colhcun [6]	NAJL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Colindo [3]	—	—	—	—	—	—	—	—	
Colin H. Livingstone [7]	KDIN	—	U.S. Shipping Board	—	P G	X	0.20	—	
Colonel John V. White [6]	WYBK	—	—	300, **600**	P G	N	—	—	
Collamer [6]	KOZZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Collingsworth	KUKX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Colon KMX [6]	KMX	250	Panama R.R. Co.	300, **600**	P G	N	0.20	—	
Colonel Albert Todd [6]	WYBI	—	—	300, **600**	P G	N	—	—	
Colonel George Armistead [6]	WYG	—	U.S. Signals	**600**	O	X	—	—	
Columbia [1]	—	—	—	—			—	—	
Colonel George F. E. Harrison [6]	WYBE	—	—	300, **600**	P G	N	—	—	

Colorado Springs [8]	KIKL	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Colthraps	KUMR	—	U.S. Shipping Board	—	P G	X	0.20	—
Columbia NGA [6]	NGA	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Columbia WHC [8]	WHC	150	U.S. Shipping Board	300, 600	P G	X	0.20	—
Columbine NLL [6]	NLL	250	Bureau of Lighthouses	600, 750, 1,000	O	X	—	—
Colusa [6]	WIN	200	Grace S.S. Co.	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Comal [8]	KEM	200	Mallory S.S. Co.	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Comanche KVC [8]	KVC	200	Clyde S.S. Co.	300, 600	P G	N	0.20	—
Comanche NRW	NRW	100	U.S. Coastguard Dept.	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Comerant	KUMQ	—	U.S. Shipping Board	—	P G	X	0.20	—
Comet [8]	KTJ	200	Standard Oil Co. of N.Y.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Comfort [9]	NDO	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Commack	KULT	—	U.S. Shipping Board	—	P G	X	0.20	—
Commissioner [7]	KOGZ	—	Merritt & Chapman Derrick & Wrecking Co.	—	P G	X	0.20	—
Commonwealth KXC [4]	KXC	50	New England S.S. Co.	300, 550, 600	P G	N	0.15	—
Communipaw [8]	KOE	200	Standard Oil Co. of N.J.	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Comus [6]	KKD	200	Southern Pacific Co.	300, 450, 600	P G	N	0.20 [11] 0.40 [12]	—
Concho [8]	KEC	300	Mallory S.S. Co.	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Concord KNC [4]	KNC	50	Colonial Nav. Co	300, 550, 600	P G	N	0.15	—
Concord NQH [9]	NQH	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Conehatta [5]	KUQQ	—	U.S. Shipping Board	—	P G	X	0.20	—
Conejos	KUKT	—	U.S. Shipping Board	—	P G	X	0.20	—
Conewago [5]	KISB	—	U.S. Shipping Board	—	P G	X	0.20	—
Conneaut [5]	WCU	100	Gulf Refining Co.	300, 600	P G	X	0.10	—
Connecticut [9]	NDQ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Conner [9]	NSN	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Connersville [7]	WKOO	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Conness Peak [7]	KUPL	—	U.S. Shipping Board	—	P G	X	0.20	—
Conotton [3]	WVAO	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Conshohocken [5]	KUGV	—	U.S. Shipping Board	—	P G	X	0.20	—
Consort [3]	KDOI	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Constellation [9]	NEDF	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Constitution [9]	NEBF	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Continental Bridge [5]	KOCP		U.S. Shipping Board	300, 600	P G	X	0.20	—
Contoocook [5]	WVAU	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Converse [9]	—	—	—	300, 600	P G	N	—	—
Conyngham [9]	NJE	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per-Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Cook KOFX [5]	KOFX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Cook NIGT [9]	NIGT	—	—	300, **600**	P G	N	—	—	
Coolcha [6]	KOPS	—	J. E. Chilberg	—	P G	X	0.20	—	
Coosa [5]	WLF	200	U.S. Shipping Board	300, 450, **600**	P G	X	0.20	—	
Coot	KUJN	—	East Coast Fisheries Co.	—	P G	X	—	—	
Copalgrove [3]	KEFJ	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Coperas [7]	WTEU	150	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Coppename [8]	KDF	500	United Fruit Co.	300, **600**	P G	N	0.40	—	
Coquina [5]	WVAA	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Coquitt [3]	KOFZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Cora F. Cressy [5]	KSZ	200	France & Canada S.S. Corporation	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Corapeak [5]	WVAE	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Corcoran [7]	WVAI	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Cordova [7]	WAR	100	Texas Co.	300, **600**	P G	X	0.20 [11] 0.30 [12]	—	
Corilla [6]	WPIA	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Cormorant NIKV [9]	NIKV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Cornelia [3]	KZD	200	Bull Insular S.S. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Corning [6]	KIH	300	Standard Oil Co. of N.J.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Cornucopia [3]	WNIU	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Corona NNQ [9]	NNQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Coronado WFZ [5]	WFZ	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Corone [6]	KUFM	—	U.S. Shipping Board	—	P G	X	0.20	—	
Corrales [7]	WPIE	150	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Corsair [6, 10]	KYC	—	J. P. Morgan	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Corsicana [5]	—	—	—	—	—	—	0.20	—	
Coson [5]	KIQV	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Corvallis [7]	KIBT	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Corvus [6]	KOPL	—	Nafra Co., Incorp.	—	P G	X	0.20	—	
Coskata [7]	KOMZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Costa Rica [6]	WQI	500	L. A. Pederson	300, **600**	P G	X	0.20	—	
Costigan [7]	KINF	—	U.S. Shipping Board	[illegible]	P G	X	0.20	—	
Costilla [6]	WMBA	200	U.S. Shipping Board	[illegible]	P G	X	[illegible]	—	

Cotopaxi [7]	WMEI	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Cotteral [7]	WCEA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Cottonplant [7]	WMEO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Cottonwood [7]	WMEU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Coulee [3]	WTOU	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Couparle [5]	WVOE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Courageous WVUA [5] ..	WVUA	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Courtois [5]	WVOI	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Coushatta [3]	WVOO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Coutolene [3]	WVOU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Covalt [5]	KEMM	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Covedale [5]	KEMN	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Covena [5]	KEMP	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Coverun [5]	KENM	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Cowan [5]	KENN	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Cowanshannock [7] ..	WMAE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Cowardin [6]	KESL	200	Nacirema S.S. Corpn.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Cowboy [7]	WMAI	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Cowee [3]	WMAO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Cowell [9]	NETV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Coweta [5]	WNEU	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Cowiche [6]	WXOA	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Coyote [6]	KXUU	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Crabtree [5]	WXOE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Craftsman [6]	KIBR	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Craigrownie [5]	WXOI	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Craigsmere [7]	WXOO	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Craincreek [5]	WNAA	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Crampton Anderson ..	KDOH	—	Pan-American Petroleum & Transport Co., Inc.	—	P G ..	X	—	—
Crane NIFB [9]	NIFB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Cranenest [3]	WNAE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Cranford [5]	KOLX	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Craster Hall [5]	KLK	200	U.S. Steel Products Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Crathorne [3]	WSOO	100	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Craven [3]	NERJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Crawlkeys [5]	WDEI	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Craycroft [7]	WNAI	200	U.S Shipping Board	300, 600	P G ..	X	0.20	—
Creole [5]	KKR	300	U.S Shipping Board	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Creole State [3]	KDLB	300	U.S. Shipping Board	300, 450, 600	P G ..	N	0.20	—
Cresap [7]	KRUA	200	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Cretan [5]	KQC	150	Merchants & Miners Trans. Co. ..	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Cricket WSEI [7] ..	WSEI	200	Cricket S.S. Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Cripple Creek [7] ..	KOJL	—	U.S. Shipping Board	—	P G ..	X	0.2c	—
Cristield [3]	KOKP	—	U.S. Shipping Board	—	P G ..	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Cristobal [6]	KMD	300	Panama R.R. Co.	300, 450, **600**	P G	N	0.20	—	
Crofton Hall [5]	KLR	200	U.S. Steel Products Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Crook [6]	WXB	500	U.S. Signals	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Crosby [9]	NESZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Cross Keys [5]	KOTD	—	U.S. Shipping Board	—	P G	X	0.20	—	
Crown City	KUSP	—	U.S. Shipping Board	—	P G	X	0.20	—	
Crowninshield [9]	NADF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Crudoil [5]	KUQD	—	Pan-American Petroleum & Transport Co.	—	P G	—	0.20	—	
Cruso [5]	WNIA	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Cuba KDLK	KDLK	—	John T. Philips	—	P G	N	—	—	
Cuba WQU [7]	WQU	300	Pacific Mail S.S. Co.	300, **600**	P G	N	0.20	—	
Cuba KDRT	KDRT	—	Peninsular & Occidental S.S. Co.	—	P G	N	—	—	
Cubore [5]	KUPP	—	Ore S.S. Corp.	—	P G	X	—	—	
Culberson	KDDV	—	U.S. Shipping Board	—	P G	X	0.20	—	
Culburra [5]	KOZR	—	U.S. Shipping Board	—	P G	X	0.20	—	
Culgoa [9]	NDU	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Cumberland NSZ [9]	NSZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Cumberland WKOI [5]	WKOI	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Cumings [9]	NIL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Cuprum	KDIJ	—	U.S. Shipping Board	—	P G	—	0.20	—	
Curacao [5]	WGK	150	Pacific Coast Co.	00, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Curlew KOSZ [6]	KOSZ	—	Curlew Co.	—	P G	X	0.20	—	
Curlew NIJB [9]	NIJB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Currier [5]	KNU	250	Gulf Refining Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Cushing NIM [9]	NIM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Cushnet [7]	KONB	—	U.S. Shipping Board	—	P G	X	0.20	—	
Cushnoc [5]	KIMJ	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	

Cuyama [9]	NOD	..	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Cyan [9]	NIFV	—	—	300, 600	P G	N	—	—
Cygan [9]	NICP	—	—	300, 600	P G	N	—	—
Cypress [6]	NLM	250	Bureau of Lighthouses	600, 750, 1,000	O	X	—	—
Cyrus W. Field [8]	WXS	130	U.S. Signals	600	O	X	—	—
D.1 [9]	NXP	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
D.2 [9]	NXQ	-	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
D.3 [9]	NXR	-	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Daca [5]	KKIA	200	Atlantic & Caribbean S.N. Co.	300, 600	P G	X	0.20	—
Dade County	KIJZ	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Dahlgren [9]	NVZ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Dakotan [5]	WKD	:00	A. H. Bull S.S. Co.	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Dale [9]	NUND	—	—	300, 600	P G	N	—	—
Dalgada [7]	KEDC	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Dallas KEQB [5]	KEQB	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Dallas NENM [9]	NENM	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Damacan [6]	KELS	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Danebrog [6]	WXAO	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Dan F. Hanlon	KDKU	—	D. J. Hanlon	—	P G	X	—	—
Daniel Webster [9]	KOKM	—	U.S. Shipping Board	—	P G	X	0.20	—
Dannedaike	KOPD	—	U.S. Shipping Board	—	P G	X	0.20	—
Danvers [6]	KOSK	—	U.S. Shipping Board	—	P G	X	0.20	—
Danville [5]	KOSJ	—	U.S. Shipping Board	—	P G	X	0.20	—
Dardania [7]	KICD	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Darden [3]	KUPK	—	U.S. Shipping Board	—	P G	X	0.20	—
Darien	KULG	—	Panama R.R. Co.	—	P G	—	—	—
Datis [3]	KICF	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Dauperata [6]	KIZJ	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Davenport [6]	KUDR	—	J. O. Davenport	—	P G	X	0.20	—
Davidson County [5]	KINX	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Davis [9]	NJF	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Dawn	KDHZ	—	William T. Donnelly	—	—	—	—	—
Dawnlite [5]	KPP	200	Standard Oil Co. of N.J.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Daylite [5]	KPR	250	Standard Oil Co. of N.J.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Dayton [5]	KNP	300	Standard Oil Co. of N.J.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Decatur [9]	NJC	—	—	300, 600	P G	N	—	—
Decatur Bridge [7]	KECJ	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Deepwater [5]	KLY	300	U.S. Shipping Board	300, 450, 600	P G	N	0.20	—
Deerfield [3]	WTIU	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Deerlodge [7]	KIMD	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Defender [3]	—	—	Atlantic Transport Co.	—	—	—	—	—
Defenders [5]	HOJF	—	U.S. Shipping Board	—	P G	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Defiance [8]	WSEA	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Delanson [5]	KOTX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Delavan [8]	KIRQ	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Delaware NEK [6]	NEK	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Delco [7]	KIZB	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Delfina [5]	KIVS	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Delight [7]	KQOE	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Delisle [6]	KIVT	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Delivery No. 5	KDCK	—	Standard Oil Co. of N.Y.	—	P G	X	—	—	
Dellwood [6]	KUBZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Delong [6]	NWB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Delphine KDRR	KDRR	—	Horace E. Dodge Estate	—	—	—	—	—	
Delphine KIFL [6]	KIFL	150	H. E. Dodge	300, 450, **600**	P G	X	0.10	—	
Delphy [6]	NEZQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Delrosa	KUTG	—	U.S. Shipping Board	—	P G	X	0.20	—	
Democracy [7]	WAQ	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Dent [6]	NEGF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Denver [6]	NEM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Deranof [8]	KQIO	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Derblay	KDDT	—	U.S. Shipping Board	—	P G	X	0.20	—	
Derbyline [5]	KIRT	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Deroche [7]	KOBJ	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Dertona [5]	KICG	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Des Moines [6]	NEN	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Des Moines Bridge [6]	KUCG	—	U.S. Shipping Board	—	P G	X	0.20	—	
De Soto [6]	KNI	250	Standard Oil Co. of N.J.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Despatch [6]	NIDF	—	—	300, **600**	P G	N	—	—	
Detroit [6]	NISP	—	—	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Detroit-Wayne [6]	KONX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Douel [7]	KOMD	—	U.S. Shipping Board	—	P G	X	0.20	—	
Devolente [8]	KIVR	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	

				1,800			0.40 [12]	—
Dia (El) [8]	KKY	200	Southern Pacific Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Diablo [7]	KEPD	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Diana KICJ [6]	KICJ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Dickerson [8]	NAFC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Dillwyn [8]	KODX	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Dilworth [7]	KOVJ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Dinsmore	KDKN	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Dio [8]	WNEO	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Director KIGJ [6] ..	KIGJ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Dirigo [8]	KEGM	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
District of Columbia ..	KDMZ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Dix [8]	WXC	300	Army	600	P G ..	N	—	—
Dixie [8]	NEP	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Dobbin [8]	NUNR	—	—	300, 600	P G ..	N	—	—
Dochet [7]	KIMR	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Dochra [8]	KGL	300	La Plata S.S. Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Dolphin NEQ [8] ..	NEQ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Donald McKay [7] ..	KULL	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Donna Lane	KDGN	—	Donna Lane Motorship Corporation	—	P G ..	X	—	—
Dora WAH [6]	WAH	100	Alaska S.S. Co.	300, 600	P G ..	X	0.20	—
Dorchester [8]	KQD	200	Merchants & Miners Trans. Co. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Dorothy Bradford [6] ..	KNA	100	Cape Cod S.S. Co.	300, 600	P ..	X	—	—
Dorsey [8]	NELG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Downes [8]	NIN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Doyen [8]	NUJS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Doylestown [7]	KIPG	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Drayton [8]	NET	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Dreadnaught [8] ..	NCX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Dryden KORK [6] ..	KORK	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Dulcino [8]	KTV	200	American Sugar Refining Co. ..	300, 600	P G ..	X	0.20	—
Duncan [8]	NIR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Dungeness WPOI [6] ..	WPOI	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Dunsyre	KUMF	—	Robert Dollar Co.	—	P G ..	—	—	—
Dupont [8]	NWC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Duquesne [7]	KECS	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Durham KDNL ..	KDNL	—	France and Canada Oil Transport Co.	—	P G ..	X	—	—
Dyer [8]	NACN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
E.1*	NXS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
E.2*	NXT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle KIR*	KIR	300	Standard Transportation Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Eagle 1*	NEJB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 2*	NEJC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 3*	NEJD	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 4*	NEJF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 5*	NEJG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 6*	NEJJ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
gle7*	NEJK	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 8*	NEJL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 9*	NEJM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 10*	NEJN	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 11*	NEJP	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 12*	NEJQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 13*	NEJR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 14*	NEJS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 15*	NEJT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 17*	NEJX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	

Eagle 18*	NEJZ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 19*	NEKB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 23*	NEKG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 25*	NEKK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 26*	NEXF	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 27*	NEXG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 28*	NEXM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 29*	NEXN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 31*	NEZG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 32*	NEZJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 33*	NIBB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 34*	NIBD	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 35*	NIBG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 36*	NIBK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 37*	NIBM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 38*	NIBN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 39*	NIBC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 40*	NIBF	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 41*	NIBJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 42*	NIBL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 43*	NIBP	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 44*	NIBQ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 45*	NIBR	—	Navy	300, 600	P G ..	N	0.20 0.40 [12]	—
Eagle 46*	NIBS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 47*	NIBT	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 48*	NIBV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 49*	NIBX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Eagle 50*	NIBZ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Eagle 51 [9]	NICB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 52 [9]	NICC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 53 [9]	NICD	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 54 [9]	NICF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 55 [9]	NICG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 56 [9]	NICJ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 57 [9]	NICK	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 58 [9]	NICL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 59 [9]	NICM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eagle 60 [9]	NICN	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
E. A. Morse [6]	KOVN	—	U.S. Shipping Board	—	P G	X	0.20	—	
Earp [9]	NEKF	—	—	300, **600**	P G	N	—	—	
East Cape [8]	KENC	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
East Chicago	KUKD	—	U.S. Shipping Board	—	P G	X	0.20	—	
Easterling [8]	KEJD	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Eastern Admiral [8]	KURM	—	U.S. Shipping Board	—	P G	X	0.20	—	
Eastern Belle	KUJT	—	U.S. Shipping Board	—	P G	X	0.20	—	
Eastern Breeze [7]	KOPP	—	U.S. Shipping Board	—	P G	X	0.20	—	
Eastern Chief [7]	KSEI	300	U.S. Shipping Board	300 **600**	P G	X	0.20	—	
Eastern Cloud [7]	KUSQ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Eastern Coast [7]	KURX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Eastern Crag [8]	KUJV	—	U.S. Shipping Board	—	P G	X	0.20	—	
Eastern Cross [7]	WKIU	300	U.S. Shipping Board	300 **600**	P G	N	0.20	—	
Eastern Crown [8]	KUNQ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Eastern Dawn [8]	KUQT	—	U.S. Shipping Board	—	P G	X	0.20	—	
Easterner [6]	WGEA	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Eastern Gale [8]	KUDZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Eastern Glade [8]	KUND	—	U.S. Shipping Board	—	P G	X	0.20	—	
Eastern Glen	KUVB	—	U.S. Shipping Board	—	P G	X	0.20	—	

			U.S. Shipping Board	—	P G ..	X	0.20	—
Eastern Leader [7] ..	KDHY	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Eastern Light [8] ..	WKII	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Eastern Maid	KUTF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Eastern Mariner [8] ..	KUGB	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Eastern Merchant [8] ..	KUKS	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Eastern Moon [8] ..	KUDX	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Eastern Ocean [7] ..	KUNF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Eastern Pilot [8] ..	KULJ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Eastern Planet [8] ..	KUPD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Eastern Queen [7] ..	KXUE	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Eastern Sea [8]	KTEA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Eastern Shore [8] ..	WKIO	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Eastern Soldier ..	KDED	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Eastern Star [8] ..	KTAU	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Eastern States [8] ..	WEE	125	Detroit & Cleveland Nav. Co. ..	300, 600	P G ..	N	0.10	—
Eastern Sun [8]	KTIE	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Eastern Sword [7] ..	KDKB	200	U.S. Shipping Board	300, 450, 600	P G ..	X	0.20	—
Eastern Temple [7] ..	KDEZ	—	U.S. Shipping Board	—	P G ..	—	0.20	—
Eastern Trader [8] ..	KULK	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Eastern Victor [7] ..	KUNR	—	U.S. Shipping Board	—	P G ..	X	0.20	—
East Hampton [6] ..	KDFZ	—	C. E. Davis Packing Co. ..	—	P G ..	—	—	—
East Indian [7]	WGEI	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Eastport [8]	WCIE	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
East Side [8]	KIMQ	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
East Wind [8]	KEKB	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Eclipse [7] ..	KEGF	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
E. C. Pope [8]	WZAU	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Ecuador [1] .. .	WBN	200	Pacific Mail S.S. Co.	300, 600, 1,800	P G ..	X	0.20 [11] 0.40 [12]	—
Edellyn [7]	KIJL	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Edenton [7]	KECB	250	U.S. Shipping Board	300, 450, 530, 600	P G ..	X	0.20	—
Edgar F. Coney ..	KDHD	—	Philip Shore	—	P G ..	X	—	—
Edgar F. Luckenbach [7]	KGK	250	Luckenbach Co.	300, 450, 530, 600	P G ..	X	0.40	—
Edgecombe [7]	WQUE	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Edgefield [8]	KEBF	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Edgehill [8]	KETN	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Edgemont [8]	KETP	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Edgemoor [8]	KEVF	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Edgewood [8]	KICM	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Edisto [7]	KILG	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Edith [8]	KZF	200	A. H. Bull S.S. Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Editor [7]	KOBG	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Edsall [9]	NUPM	—	—	300, 600	P G ..	N	—	—
Edward J. Lawrence [8]	KQY	200	French Overseas Corporation ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Edward L. Doheny, Jr. [8]	WIJ	200	Pan-Amer. Petroleum Trans. Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Edward Luckenbach [7]	KGQ	250	Luckenbach Co.	300, 450, 525, 600	P G ..	X	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Edward Pierce [6]	KMOU	—	Crowell & Thurlow S.S. Co.	—	—	—	—	—	
Edwards [9]	NIGL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eelbeck [6]	KINQ	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Effingham [6]	KOLT	—	U.S. Shipping Board	—	P G	X	0.20	—	
Effna [6]	KOMT	—	U.S. Shipping Board	—	P G	X	0.20	—	
Egeria	KDCJ	—	Coast Shipbuilding Co.	—	P G	X	—	—	
Eglantine [7]	KOPT	—	U.S. Shipping Board	—	P G	X	0.20	—	
Egremont [8]	KOQS	—	U.S. Shipping Board	—	P G	X	0.20	—	
Eider KOKJ [6]	KOKJ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Eider NIKR [9]	NIKR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
E. J. Earling [8]	WEI	200	Franklin S.S. Co.	300, **600**	P G	X	0.10	—	
Elcano NFD [9]	NFD	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Eldena [6]	KEVG	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
E. L. Doheny III [6]	WROO	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Eldorado [6]	KMOI	—	Swayne & Hoyt	—	—	—	—	—	
Eldridge [7]	KICN	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
El Estero	KDKT	—	Southern Pacific Co.	—	P G	X	—	—	
Elfay [7]	KOVQ	—	Russell A. Alger	—	—	—	—	—	
Elinor [7]	KVR	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Elisha Walker	KDGQ	—	Pan-American Petroleum & Transport Co., Los Angeles	—	P G	X	—	—	
El Isleo	KDNA	—	Southern Pacific Co.	—	P G	X	—	—	
Elkhorn [6]	KOCL	—	U.S. Shipping Board	—	—	—	—	—	
Elkridge [6]	KISG	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Elkton [6]	KOFK	—	U.S. Shipping Board	—	P G	X	0.20	—	
El Lago	KDNW	—	Southern Pacific Co.	—	P G	X	—	—	
Ellington [6]	NLN	—	Department of Labour	300, **600**	O	X	—	—	
Elliot [9]	NERV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Ellis NIFD [9]	NIFD	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Elmac	KDCY	—	Saginaw Shipbuilding Co.	—	P G	X	—	—	
Elmsport [6]	KILP	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Emergency Aid	KDKD	—	U.S. Shipping Board	—	P G	X	0.20	—	
Endicott [7]	KOUN	[illegible]	U.S. Shipping Board	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

Enterprise	WMN	200	—	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Eocene [8]	KTM	300	—	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Epitacio Pessoa [8] ..	KOCC	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Ericsson [9]	NIS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
E. R. Kemp [8] ..	KDQD	—	Sinclair Navigation Co.	—	P G ..	X	0.40	—	
Ernest H. Meyer [8] ..	WMJ	200	Broughton & Wiggins Nav. Co...	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
E. R. Sterling [8] ..	WIS	250	—	300, 565, 600	P G ..	X	—	—	
Escambia [7]	KOGK	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Esopus [7]	KETF	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Esparta [8]	KDO	300	—	300, 450, 600	P G ..	X	0.40	—	
Esperanza [8]	KWZ	200	—	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Essex KQE [5]	KQE	200	—	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Estrada Palma ..	KDMG	—	Florida East Coast Rly. Co. ..	—	—	—	—	—	
Ethan Allen [7]	KUJQ	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Eugene V. R. Thayer ..	KDMA	—	Sinclair Navigation Co.	—	P G ..	X	—	—	
Eurana [5]	KJG	150	—	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Evans [9]	NEMS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Evansville [8]	KIKT	150	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Evelyn KZP [5] ..	KZP	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Everett KUQR ..	KUQR	—	Charles R. McCormick & Co. ..	—	P G ..	—	—	—	
Everett KZT [5]	KZT	200	—	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Everglades [8]	WQEE	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Evergreen City [7] ..	KUNJ	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
E. W. Sinclair [5] ..	KDRN	—	Sinclair Navigation Co.	—	P G ..	X	0.20	—	
Excelsior [5]	KKO	300	—	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Explorer KIVN [8] ..	KIVN	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Explorer NAVM [9] ..	NAVM	—	—	300, 600	P G ..	N	—	—	
Evyota [8]	KKII	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
F.2 [9]	NXV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
F.3 [9]	NXW	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Fahrenheit [9]	NECK	—	—	300, 600	P G ..	N	—	—	
Fairfax [9]	NTN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Fairfield City	KDPY	—	U.S. Steel Products Co.	—	P G ..	N	—	—	
Fairmont [8]	KXT	—	—	—	—	—	—	—	
Fair Oaks [8]	WSM	—	Parr-McCormick S.S. Lines ..	—	—	—	—	—	
Faith [8]	KJOA	500	U.S. Shipping Board	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Falcon [9]	NEKN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Falmouth [9]	WKOE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Fanning [9]	NFM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Faraby [7]	KEJV	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Fargo [6]	KONL	—	U.S. Shipping Board	—	P G	X	0.20	—	
Farnam [3]	KQIE	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Farquhar [9]	NANZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Farragut [9]	NVS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Fassett [5]	KMUO	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Fathomer [9]	NESR	—	—	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Favorite KDNY	KDNY	—	—	—	—	—	—	—	
Favorite KIFG [5]	KIFG	150	Great Lakes Touring Co	300, **600**	P G	X	0.10	—	
Favorite WCF [6]	WCF	100	U.S. Shipping Board	300, **600**	P G	X	0.10	—	
Fayette Brown [5]	WQC	200	Harvey H. Brown & Co.	300, 450, **600**	P G	X	0.10	—	
F. B. Squire [6]	WFU	100	Jenkins S.S. Co.	300, 450, **600**	P G	X	0.10	—	
F. C. Latrobe	KDOL	—	City of Baltimore	—	—	—	—	—	
F. D. Asche [6]	KSUA	300	Standard Oil Co. of N.Y.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Fearless [6]	KDRA	—	Ship Owners and Merchants Jugboat Co.	—	—	—	—	—	
Federal [7]	WDOO	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Federal Bridge [7]	KOCN	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Felix Taussig [6]	KXZ	—	Crowell & Thurlow S.S. Co.	300, **600**	—	—	—	—	
Feltore [5]	KFG	200	Ore S.S. Company	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Fern [9]	NAFV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Fernandina WTIA [6]	WTIA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Finch [9]	NAJP	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Finland [5]	KSF	200	International Mercantile Marine Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Firmore [5]	KXD	200	Ore S.S. Company	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Firthcliffe [7]	KITF	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Fish Hawk NFV [9]	NFV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Fish Hawk WKIA [6]	WKIA	150	Fishhawk Company	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	

F. J. Luckenbach [7]	WNZ	—	Luckenbach Co.	300, 600	P G ..	X	0.20	—
Flamingo [9]	NIJN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Flavel [7]	WQUI	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Flectco [5]	KURK	—	U.S. Shipping Board	—	P G ..	N	0.20	—
Floraba [3]	KDHE	—	Gulf Navigation Co.	—	P G ..	—	—	—
Florence Luckenbach [7]	WNM	200	Luckenbach Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Florence Olson [5] ..	WPK	—	Oliver J. Olson & Co.	300, 600	P G ..	—	0.20 [11] 0.40 [12]	—
Florida KUS [5] ..	KUS	200	Texas Company	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Florida NFR	NFR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Florida WJJ [5] ..	WJJ	100	Goodrich Transit Co.	300, 600	P G ..	X	0.10	—
Floridian [2] [5]	WLR	300	A. H. Bull S.S. Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Fluor Spar	KIQX	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Flusser [9]	NUNF	—	—	300, 600	P G ..	N	—	—
Folsom [5]	WQOO	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Fonduro [3]	KNUA	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Foote [9]	NWF	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Fordonian [5]	KRU	300	A. J. Outerbridge	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Forster [7]	KKIE	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fort Armstrong ..	KUKF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Fort Bragg [6]	WLH	—	Chas. H. Higgins	300, 600	—	—	—	—
Fort George [6]	KBIA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fort Leavenworth [3] ..	KEPB	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fort Pitt Bridge [3] ..	KWB	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fort Riley [5]	WNOE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fort Russell [7]	WNOU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fort Scott [5]	KEBJ	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fort Seward [5]	KEVJ	—	—	300, 600	P G ..	X	0.20	—
Fort Sill [7]	KEBL	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fort Smith [5]	KEBK	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fort Stevens [5] ..	KEBG	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fortune [9]	NEGS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Fort Wayne [5]	WDOU	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Fort Worth [6]	KDL	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fort Wright [5]	KTEO	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fourth Alabama [5] ..	KIXJ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Fox [9]	NWJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
F. Q. Barstow [5] .	KNQ	200	Standard Oil Co. of N.J. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Frank G. Drum ..	KDQZ	—	—	—	—	—	—	—
Frank H. Buck [1] ..	WTO	150	Associated Oil Co.	300, 600, 1,800	P G ..	X	0.20 [11] 0.40 [12]	—
Franklin KDQK ..	KDQK	—	Galena Navigation Co.	—	P G ..	X	—	—
Franklin WFF [5] ..	WFF	250	Coastwise Transportation Co. ..	300, 450, 600	P G ..	X	—	—
Franklin County [6] ..	KOTV	—	U.S. Shipping Board	—	P G ..	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Franklin K. Lane ..	KDLH	—	Pan-American Petroleum & Transport Co.	—	P G ..	X	—	—	
Fred Baxter [6]	WOG	—	Fred Baxter S.S. Co.	—	—	—	—	—	
Frederick [9]	NJS	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Frederick Ewing [5] ..	WNQ	200	Pan-American Petroleum & Transport Co., Inc.	300, 450, **600**	P G ..	X	0.40	4.00	
Frederick Luckenbach [7]	KGV	200	Luckenbach Co.	300, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Frederic R. Kellogg [5] ..	WIQ	—	Pan-American Petroleum & Transport Co.	300, **600**	—	—	0.20 [11] 0.40 [12]	—	
Fred J. Talbot [9] ..	NIGR	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Fred W. Weller [5] ..	KNY	300	Standard Oil Co. of N.J. ..	300, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Freeman [6]	WMM	—	Pocahontas Fuel Co.	—	—	—	—	—	
Freeport Sulphur No. 1 [5]	KRA	100	Freeport Sulphur Trans. Co. ..	300, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Freeport Sulphur No. 2 [5]	KRG	200	Freeport Sulphur Trans. Co. ..	300, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Freeport Sulphur No. 5 [5]	KUMK	—	Freeport Sulphur Transport Co. ..	—	P G ..	—	0.20	—	
Freeport Sulphur No. 6 [5]	KUNP	—	Freeport Sulphur Transportation Co.	—	P G ..	—	0.20	—	
Fresno [5]	KTIO	150	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Frieda [7]	KFF	150	Union Sulphur Co.	300, 440, 525, **600**	P G ..	X	0.40	—	
Fueloil [5]	KUQB	—	Pan-American Petroleum & Transport Co.	—	P G ..	—	0.20	—	
Fuller [9]	NIFG	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
G1 [9]	NXY	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
G2 [9]	NXZ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
G3 [9]	NYA	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
G4 [9]	NYD	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Gaffney [6]	KICR	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	

Galesburg [7]	WGAE	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Galveston KDQE ..	KDQE	—	U.S. Shipping Board	—	P G ..	N	0.20 [11]	—
Galveston NGD [6] ..	NGD	—	Navy	300, 600			0.40 [12]	
Gamble [6]	NEZR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Ganeri [6]	KERL	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Gannet [6]	NIJX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Garfield [3]	WQOE	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Gargoyle	KDPE	—	Vacuum Oil Co.	—	P G ..	X	—	—
Garibaldi KROU [3] ..	KROU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Gateway City	KDFD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Gdansk [1]	WHJ	150	Polish American Nav. Corp. ..	300, 600, 1800	P G ..	N	0.40	—
Gene Crawley [3] ..	KQF	200	Sinclair Nav. Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
General Absalom Baird [6]	WYBA	—	—	300, 600	P G ..	N	—	—
General Alava [6] ..	NAMG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
General A. M. Randal [6]	WYJ	30	Government	600	O ..	X	—	—
General Edmund Kirby [6]	WYBF	—	—	300, 600	P G ..	N	—	—
General E. O. C. Ord [6]	WYF	100	Government	600	O ..	X	—	—
General George H. Weeks [6]	WZT	30	Government	600	O ..	X	—	—
General G. W. Gettey [6]	WYS	30	Government	1,200	O ..	X	—	—
General G. W. Goethals [3]	KMZ	250	Panama R.R. Co.	300, 600	P G ..	N	0.20	—
General Harvey Brown [6]	WYK	30	Government	—	O ..	X	—	—
General Henry J. Hunt [6]	WYD	100	Government	600	O ..	X	—	—
General Henry Knox [6]	WYE	100	Government	600	O ..	X	—	—
General H. F. Hodges [6]	KPG	250	Panama R.R. Co.	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
General J. Franklin Bell [6]	WYBB	—	—	300, 600	P G ..	N	—	—
General J. M. Brannon [6]	WZV	30	Government	600	O ..	X	—	—
General John M. Schofield [6]	WXW	30	Government	600	O ..	—	—	—
General John P. Story [6]	WYBH	—	—	300, 600	P G ..	N	—	—
General Miffin [6] ..	WZX	30	Government	600	O ..	X	—	—
General Nathaniel Greene [6]	WZR	30	Government	600	O ..	X	—	—
General O. H. Ernst [3] ..	KPF	250	Panama R. R. Co.	300, 600	P G ..	N	0.20	—
General R. B. Ayres [6] ..	WYL	100	Government	600	O ..	N	—	—
General R. H. Jackson [6]	WYW	20	Government	400	O ..	N	—	—
General Richard Arnold [6]	WYY	30	Government	600	O ..	X	—	—
General R. N. Batchelder [6]	WZW	30	Government	600	O ..	X	—	—
General Robert Anderson [6]	WYH	30	Government	600	O ..	X	—	—
General Robert W. Swartoot [6]	WYU	25	Government	425	O ..	X	—	—
General Royal T. Frank [6]	WYA	100	Government	—	O ..	X	—	—
General S. B. Holobaird [6]	WYV	30	Government	600	O ..	X	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
General S. N. Mills [8]	WYB	200	Government	600	O	X	—	—	
General Timethy Pickering [8]	WZQ	200	Government	**600**, 1,200	O	X	—	—	
General Wallace F. Randolph [9]	WYBG	—	—	300, **600**	P G	N	—	—	
General W. C. Gorgas [8]	KIP	250	Panama R.R. Co.	300, **600**	P G	N	0.20	—	
General William M. Graham [8]	WEY	—	Government	—	—	—	—	—	
Genesee KIDL [8]	KIDL	300	W. K. Vanderbilt, Jr.	300, 450, **600**	P G	X	—	—	
Geo. E. Badger [9]	NUJG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Geo. G. Henry [5]	WIT	150	Pan-Amer. Petroleum Trans. Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Geo. H. Jones [8]	KIPS	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Geo. L. Harvey	KDET	—	—	—	P G	—	—	—	
George B. MacKenzie [8]	KUNT	—	American Bauxite Co.	—	P G	X	0.20	—	
George C. Greer [8]	KOQL	—	U.S. Shipping Board	—	P G	X	0.20	—	
George E. Weed	KDIM	—	U.S. Shipping Board	—	P G	X	0.20	—	
George Pierce	KDLT	—	U.S. Shipping Board	—	P G	X	0.20	—	
George Washington KDCL	KDCL	—	U.S. Shipping Board	—	P G	N	0.20	—	
Georgia KUR [5]	KUR	200	Texas Company	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Georgia NGF [9]	NGF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Georgia WFA [5]	WFA	150	Goodrich Trans. Co.	300, **600**	P G	X	0.10	—	
Georgina Rolph	KETX	—	Rolph Nav. & Coal Co.	—	—	—	—	—	
Geo. Washington [9]	NEC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Geo. W. Barnes [8]	KMUI	—	Pan-Amer. Petroleum Trans. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Gillis [9]	NERR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Gilmer [9]	NERB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Glacier [9]	NGH	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
[illegible]	KDAV	—	U.S.-Mexican Oil Corporation	[illegible]	P G	N	[illegible]		

				300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Glen Ridge [5]	KIRZ	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Glen White [6]	KSIE	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Gloucester KQG [5]	KQG	150	Merchants & Miners Trans. Co.	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Glymont [5]	KEXZ	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Glyndon [5]	KEZQ	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Goff [6]	NUQF	—	—	300, 600	P G	N	—	—
Golden State	KDCM	—	U.S. Shipping Board	—	P G	X	0.20	—
Goldsborough [6]	NGJ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	
Gold Shell [5]	WIE	250	Gold Shell S.S. Co.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Gold Star KDPZ	KDPZ	—	—	—	—	—	—	—
Gonzaba [4]	KDFL	—	Gulf Navigation Co.	—	P G	—	—	—
Gonzalia [6]	KOBQ	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Goodspeed [3]	WKEO	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Goree [3]	WLII	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Gorgona KDNZ	KDNZ	—	—	—	—	—	—	—
Gorgona NDJ [6]	NDJ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Governor WGR [5]	WGR	300	Pacific Coast Co.	300, 450, 600	P G	N	0.20 [11] 0.40 [12]	—
Governor Cobb [5]	KRB	200	Eastern S.S. Lines	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Governor Dingley [6]	KRV	200	Eastern S.S. Lines	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Governor John Lind [3]	WRUE	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Graham [6]	NAGJ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Grand Haven [6]	KEXR	—	Grand Trunk Car Ferry Line	—	—	—	—	—
Granite State	KDOZ	—	U.S. Shipping Board	—	P G	N	0.20	—
Gratia	—	—	Gratia Navigation Co.	—	—	—	—	—
Gray Eagle [7]	KEZT	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Grayling [3]	KEVL	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Great Falls [6]	KUFK	—	U.S. Shipping Board	—	P G	X	0.20	—
Great Northern [6]	WIR	150	Army	300, 450, 600	P G	N	—	—
Grebe KUMJ	KUMJ	—	East Coast Fisheries Co.	—	P G	X	—	—
Grebe NIKX [6]	NIKX	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Grecian [6]	KQR	150	Merchants & Miners Transportation Co.	300, 450, 600	P G	N	0.20 [11] 0.40 [12]	—
Greene [6]	WIGM	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Greenland [7]	KUPG	—	U.S. Shipping Board	—	P G	X	0.20	—
Greenwood [6]	WLL	—	Greenwood S.S. Co.	—	—	—	—	—
Greer [6]	NERT	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Gregory NAJR [6]	NAJR	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Gresham [6]	NRG	200	U.S. Coastguard Dept.	464, 600, 756	P G	N	0.20 [11] 0.10 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Gridley [8]	NEMX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Griffco	KDFN	—	James Griffiths & Sons (Inc.)	—	P G	—	—	—	
Griffdu	KDIL	—	Universal S.S. Co.	—	—	—	—	—	
Guantanamo [8]	KWN	250	N.Y. & Cuba S.S. Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Guardian [8]	WGZ	200	Central & S. American Telegraph Co.	300, **600**	P G	X	0.20	—	
Guardsman [8]	KIVX	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Guaro [3]	WJV	150	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Guimba [7]	WJIE	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Gulfcoast [8]	KUE	200	Gulf Refining Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Gulfking	KDNO	—	Gulf Refining Co.	—	P G	X	—	—	
Gulfland [8]	KUD	—	—	—	—	—	0.20 [11] 0.40 [12]	—	
Gulflight [8]	KUA	200	Gulf Refining Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Gulfmaid [8]	KUB	200	Gulf Refining Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Gulf of Mexico [8]	KUC	200	Gulf Refining Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Gulfoil [8]	KTG	200	Gulf Refining Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Gulfport [8]	KREE	200	Freeport & Tampico Fuel Oil Trans. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Gulf Prince	KDRB	—	—	—	—	—	—	—	
Gulf Queen [8]	KVS	—	Gulf Refining Co.	—	—	—	—	—	
Gulfstar	KDEB	—	Gulf Refining Co.	—	P G	X	0.20[11] 0.40[12]	—	
Gulfstream [8]	KTB	250	Gulf Refining Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Gulftrade [3]	KOVB	—	Gulf Refining Co.	—	P G	X	0.20[11] 0.40[12]	—	
Gunston Hall [7]	KICV	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Gwin [8]	NAGX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
H	NYC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	

H 2 [9]	NYD	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	
H 3 [9]	NYE	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
H 4 [9]	NEQM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
H 5 [9]	NETG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
H 6 [9]	NEFC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
H 7 [9]	NESJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
H 8 [9]	NELN	—	Navy	330, 600	P G ..	N	0.20 [11] 0.40 [12]	—
H 9 [9]	NEBV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Haddon [3]	KIRN	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Hadnot [7]	KOGP	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Hagan [3]	KOQC	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Hagood [6]	KOQD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Hahatonka [7]	KUPF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Halcyon [6, 10]	KZL	100	D. W. Flint	300, 450, 600	P G ..	X	—	—
Hale [9]	NACL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Haleakala [3]	KORL	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Halo KDCP	KDCP	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Halsey	KDDR	—	U.S. Shipping Board		P G ..	X	0.20	—
Halway	KDFQ	—	U.S. Shipping Board	—	P G ..	—	0.20	—
Hamilton NIFL [9] ..	NIFL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Hampden [6]	WXUI	300	Coastwise Transportation Co. ..	300, 600	P G ..	X	—	—
Hampton Roads [6] ..	KESR	—	U.S. Shipping Board	—	—	—	0.20	—
Hancock [9]	NHI	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Hancock County [6] ..	KORT	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Hanley	KDIF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Hannawa	KDFR	—	U.S. Shipping Board	—	P G ..	—	0.20	—
Hannibal [9]	NGU	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Hanover [3]	KOJK	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Haraden [9]	NEXZ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Harbor Tug No. 61 [9] ..	NUMX	—	—	300, 600	P G ..	N	—	—
Harbor Tug No. 74 [9] ..	NEKP	—	—	300, 600	P G ..	N	—	—
Harding [9]	NEMV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Harish [3]	WSIE	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Harold Walker [5] ..	WIX	200	Petroleum-Transport Co. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Harry Farnum [6]	KQA	300	Sinclair Nav. Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Harry Luckenbach [7] ..	KIGS	—	Luckenback S.S. Co.	300, 600	P G ..	N	0.20	—
Harry W. Croft [5] ..	WQF	200	Harvey H. Brown & Co.	300, 450, 600	P G ..	X	0.10	—
Hart [9]	NENV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs,	Francs,	
Hartford KOSX [5]	KOSX	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Hartford NGV [9] ..	NGV	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Hartwood [6]	KEVR	—	Hart-Wood Lumber Co.	—	—	—	—	—	
Harvester KDHC ..	KDHC	—	Texas S.S. Co., N.Y.	—	P G ..	X	—	—	
Harvester (The) [5] ..	WCR	200	International Harvester Co. ..	300, **600**	P G ..	X	0.10	—	
Harvey H. Brown [5] ..	WQE	200	Castner, Curran & Bullitt ..	300, 450, **600**	P G ..	X	0.10	—	
Haaslehurst [6]	KOXB	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Hastings	KDDL	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Haatchie [7]	KIVJ	—	U.S. Shipping Board	—	—	—	0.20	—	
Haatfield [9]	NEZV	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Hathaway [5]	KODK	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Hatteras [3]	WNV	200	U.S. Shipping Board	300, 450, **600**	P G ..	X	0.20	—	
Hattie Luckenbach [7] ..	WNF	200	Luckenbach Co.	300, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Haverhill [7]	WLUE	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Havilah [3]	KUJK	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Hawaiian [3]	WKU	200	Amer.-Hawaiian S.S. Co. ..	300, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Hawarden [3]	KUPX	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Hawkeye State ..	KDNV	—	U.S. Shipping Board	—	P G ..	N	0.20	—	
Haxtum	KUTB	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Haynie [7]	KDCR	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Hazelwood [9]	NENS	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
H. C. Folger [5]	KHS	250	Atlantic Refining Co.	300, 450, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Heather NAKL [9] ..	NAKL	—	Bureau of Lighthouses	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Heber	KDDU	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Hector NGX [9]	NGX	—	Navy	300, **600**	P G .	N	0.20 [11] 0.40 [12]	—	
Heffron [7] .. .	WBAI	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Hegira [5]	KIDF	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Helen [3]	KZH	200	Bull-Insular S.S. Co.	300, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Helena [9] . ..	NGY	—	Navy	300, **600**	P G .	N	0.20 [11] 0.40 [12]	..	

Henderson [9]	NOH		Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	
Henley [9]	NHA	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Henry Clay [5]	KESZ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Henry County [6] ..	KOMS	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Henry D. Whiton ..	KDRM	—	Union Sulphur Co.	—	P G ..	X	—	—
Henry J. Biddle [6] ..	WOW	250	Western Fuel Co.	300, 600	P G ..	X	0.20	—
Henry M. Flagler [5] ..	KOX	200	Florida E. Coast Car Ferry Co. ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Henry R. Mallory [5] ..	KEF	250	—	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Henry S. Grove ..	KDLN	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Henry Steers [7]	KURR	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Henry Wilson [6] ..	WZS	30	Government	600	O ..	X	—	—
Henshaw [9]	NUJQ	—	Navy	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Hera KDGA	KDGA	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Herbert [9]	NEMJ	—	—	—	—	—	0.20 [11] 0.40 [12]	—
Herbert G. Wylie [5] ..	WIF	350	Pan-Amer. Petroleum & Trans. Co.	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Herbert L. Pratt [6] ..	KOY	—	Atlantic Refining Co.	300, 600	P G ..	X	0.20	—
Hercules KOCT [6] ..	KOCT	—	Rolph Nav. & Coal Co.	—	—	—	—	—
Hercules NEKR [9] ..	NEKR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Heredia [5]	KDH	500	United Fruit Co.	300, 600	P G ..	N	0.40	—
Herman Frasch ..	KDLW	—	Union Sulphur Co.	—	P G ..	X	—	—
Herman Winter [6] ..	WDAO	—	Eastern S.S. Lines	—	—	—	—	—
Hermosa [5]	WBP	150	Wilmington Trans. Co.	300, 600	P G ..	X	0.05	—
Herndon [9]	NENJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Heron KUDF [6] ..	KUDF	—	East Coast Fisheries Co.	—	P G ..	X	—	—
Heron NENL [9] ..	NENL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
H. F. Dimock [5] ..	KEN	200	Eastern S.S. Lines	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
H. F. Morse [7]	KOFJ	—	U.S. Transport Co.	—	P G ..	X	0.20	—
H. H. Rogers [5]	KSI	300	Standard Oil Co. of N.J.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Hibiscus [9]	NAKN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Hickman [5]	WFOA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Hico [5]	KECK	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Higho [5]	KUBV	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Hillsborough County [7]	KIKB	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Hilton [5]	KZK	—	A. H. Bull S.S. Co.	300, 600	—	—	0.20 [11] 0.40 [12]	—
Himoto [5]	KILC	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Hinckley [3]	KURB	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Hisko [5]	WQD	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
H. M. Flagler [5] ..	KER	400	Standard Oil Co. of N.J.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
H. M. Whitney [5,10] ..	WPV	—	Acme S.S. Co.	—	—	—	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Hoboken	KDEQ	—	—	—	—	—	—	—	
Hogan [9]	NEXT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Hog Island [8]	KODV	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Hokah [7]	WJAE	150	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Holbrook WQII [7]	WQII	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Holden Evans [8]	KMY	150	Holden A. Evans S.S. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Holland NIRM [9]	NIRM	—	—	300, **600**	P G	N	—	—	
Hollywood KDCS	KDCS	—	U.S. Shipping Board	—	P G	X	0.20	—	
Hollywood WKH [9]	WKH	250	Pacific-Amer. Fisheries	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Holyoke Bridge [8]	KUCJ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Homer	KUMG	—	Pacific Mail S.S. Co.	—	P G	—	—	—	
Homestead [7]	KEKR	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Honolulu [8]	WMZ	100	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Hoosac [8]	WQAU	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Hopatcong	KDKC	—	U.S. Shipping Board	—	P G	X	0.20	—	
Hopewell [8]	NEXX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Horace X. Baxter [9]	WOF	300	U.S. Shipping Board	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Horado [8]	KECT	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Houma [8]	WTUO	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Housatonic NFX [9]	NFX	—	Navy	300, **600**	P G	N	0.20	—	
Houston KDCO	KDCO	—	U.S. Shipping Board	—	P G	X	0.20	—	
Houston NGZ [9]	NGZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Hoven [8]	KEXV	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Hovey [9]	NEPB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Howard KQH [9]	KQH	200	Merchants & Miners Trans. Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Howard NIFM [9]	NIFM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Howick Hall [9]	KLT	200	U.S. Steel Product. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Hoxbar [7]	KIJQ	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Hoxie [7]	KEMK	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	

Hubbard [9]	NDX	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—
Hudsonian [7]	KUCL	—	U.S. Shipping Board	300, 450, **600**	P G ..	N	0.20	—
Hugaton [5]	KIQR	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—
Huguenot [5]	KIVQ	—	U.S. Shipping Board ..	300, **600**	P G ..	X	0.20	—
Hukey [6]	KIFC	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—
Hulaco [5]	KODQ	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—
Hulbert [9]	NUKD	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—
Hulver [6]	KIGD	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—
Humacenna [7]	KIGC	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—
Humbolt [5]	WHX	100	Humboldt S.S. Co.	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—
Humphreys [9]	NURX	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—
Humrick [5]	KIFN	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—
Hunt [9]	NUJF	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—
Huntington [9]	NWG	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—
Huron KUSD ..	KUSD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Huron KVH [5] ..	KVH	300	Clyde S.S. Co.	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—
Hutchinson [5]	KUJP	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Hyacinth [9]	NAGV	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—
Hyades [6]	WMK	200	Matson Nav. Co.	300, 450, **600**	P G ..	X	0.20 [11] 0.40 [12]	—
Hyannis [3]	KINC	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—
Ice King [3]	KJUA	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—
Iceland [7]	KOKK	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Iconium [7]	WQUO	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—
I. C. White	KDDB	—	Pan-American Petroleum and Transport Co., Inc.	—	P G ..	X	—	—
Ida WLV [5]	WLV	250	U.S. Shipping Board	300, 450, **600**	P G ..	N	0.20	—
Idaho NHN [9]	NHN	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—
I. D. Fletcher [5] ..	KFI	200	Coast Transit Co.	300, **600**	P G ..	X	0.20 [11] 0.40 [12]	—
I. J. Merritt [5]	KOVZ	—6	Merrit & Chapman Derrick and Wrecking Co.	—	P G ..	X	—	—
Illinois NHO [9] ..	NHO	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—
Illinois WCZ [5] ..	WCZ	150	Northern Mich. Transportation Co.	300, **600**	P G ..	X	0.10	—
Imlay [3]	KIZV	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—
Independence [7] ..	WJIO	—	U.S. Shipping Board	300, 450, **600**	P G ..	N	0.20	—
Independent	WPI	—	National Independent Fisheries Co.	—	—	—	—	—
Independent Bridge [7]	KOGB	—	U.S. Shipping Board	—	P G ..	X	0.20	—
India Arrow	KDHP	—	Standard Transportation Co. ..	—	P G ..	X	—	—
Indiana NHQ [9] ..	NHQ	—	—	300, **600**	P G ..	N	—	—
Indiana WFC [5] ..	WFC	100	Goodrich Transit Co.	300, **600**	P G ..	X	0.10	—
Indiana Bridge [5] ..	KOND	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Indiana Harbor [6] ..	KUBS	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Indianapolis [3]	WROE	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—
Ingold [3]	WLUU	300	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Ingraham [9]	NENX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Ingram [9]	NIGF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Innoko [5]	KITJ	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Inspector [3]	KOKR	—	U.S. Shipping Board	—	P G	X	0.20	—	
Intan [5]	KIGK	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Intrepid [5]	KDHI	—	W. S. Kilmer	—		—	0.20	—	
Invincible [6]	WCII	300	—	300, **600**	P G	N	0.20	—	
Iowa [9]	NHT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Iowan [8]	WKJ	250	Amer.-Hawaiian S.S. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Ipswich [8]	KILV	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Iris WOJ [7]	WOJ	200	U.S. Shipping Board	300, 450, **600**	P G	X	0.20	—	
Iroquois KUTQ [6]	KUTQ	—	Puget Sound Navigation Co.	—	P G	X	0.20	—	
Iroquois KVF [2]	KVF	300	Clyde S.S. Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Iroquois NHV [9]	NHV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Irvington [5]	KOGQ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Isaac L. Rice [6]	WKK	—	Electric Boat Co.	—	—	—	—	—	
Isanti [3]	WVEU	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Isherwood [9]	NUNV	—	—	300, **600**	P G	N	—	—	
Isis NQA [9]	NQA	—	—	300, **600**	P G	N	—	—	
Isonomia [8]	KEL	275	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Isreal [9]	NENG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Issaquena [6]	KPIU	200	U.S. Shipping Board	300, **600**, 952	P G	X	0.20	—	
Italia KUPB	KUPB	-	Submarine Boat Corp.	—	P G	X	—	—	
Itanca [6]	WGUE	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Itasca [6]	NRI	200	U.S. Coast Guard, Treasury Dept.	300, **600**	P G	N	0.20	—	
Itompa [6]	KENR	200	Nacirema S.S. Corporation	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Iuka [9]	NEVR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Ivy [9]	NAKV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	

J. A. Bostwick [8] ..	KJN	400	Standard Oil Co. of N.J. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Jackson [7]	KIKC	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Jacksonville [7]	KOJG	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Jacob Jones [9]	NEPZ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Jacona [7]	WQUU	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Jacox [3]	KEML	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Jadden [7]	KORM	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Jalapa	KDCW	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Jamaica [3]	WLB	—	Jamaica Navigation Co.	300, 600	P G ..	X	0.20	—
James K. Paulding [9] ..	NUJM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	— —
James McGee [8] ..	KTP	—	Standard Oil Co. of N.J.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
James S. Whitmey [6] ..	WPW	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Jamestown [5]	KOC	200	Old Dominion S.S. Co.	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
J. A. Moffett [8] ..	WRE	150	Standard Oil Co. of Calif. ..	300, 600, 1,610, 1,800	P G ..	X	0.20 [11] 0.40 [12]	—
Janelaw	KDFS	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Japan Arrow	KDHO	—	Standard Transportation Co. ..	—	P G ..	X	—	—
Jarvis [9]	NIB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Jason NNB [9]	NNB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Java Arrow	KDHQ	—	Standard Transportation Co. ..	—	P G ..	X	—	—
J. B. Stetson [6] ..	WVUE	200	Pacific Mercantile Marine Co. ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
J. C. Donnell [8] ..	WJM	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Jean [8]	KZJ	—	A. H. Bull S.S. Co.	300, 600	—	—	0.20 [11] 0.40 [12]	—
Jeannette Skinner [8] ..	WQW	300	U.S. Shipping Board	300, 450, 525, 600	P G ..	X	0.20	—
Jeff Davis	KDQF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Jefferson KOD [8] ..	KOD	200	Old Dominion S.S. Co.	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Jefferson WAJ [7] ..	WAJ	100	Alaska S.S. Co.	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Jefferson County ..	KKF	1,000	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Jekyl [3]	KEBS	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Jennie R. Morse [7] ..	KUNN	—	U.S. Shipping Board	—	P G ..	X	0.20	—
J. E. O'Neil [7]	KSB	300	Atlantic Refining Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Jeptha	KDFU	—	U.S. Shipping Board	—	P G ..	—	0.20	—
J. Fletcher Farrell [5] ..	KDHR	—	—	—	P G ..	X	0.20	—
J. F. Penrose	KUQN	—	National Oil Transport Co. ..	—	P G ..	X	0.20	—
J. L. Luckenbach [7] ..	KGT	200	Luckenbach Company	300, 600	P G ..	X	0.20	—
J. L. Reiss [3]	KURJ	—	American S.S. Company	—	P G ..	—	0.20	—
J. M. Danziger [5] ..	WIW	250	Pan.-Amer. Petroleum & Trans. Company	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
J. M. Guffey [3]	KTF	200	Gulf Refining Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge.		Remarks.
							Per Word.	Minimum per Radio-telegram.	
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Johanna Smith[5]	WHZ	150	Coos Bay Lumber Co.	300, **600**	P G	X	0.20[11] 0.40[12]	—	
Johansson[9]	NIQP	—	—	300, **600**	P G	N	—	—	
John Adams[5]	KOSS	—	U.S. Shipping Board	—	P G	X	0.20	—	
John D. Edwards[9]	NUPC	—	—	300, **600**	P G	N	—	—	
John D. Rockefeller[5]	KTO	200	Standard Oil Co. of N.J.	300, **600**	P G	X	0.20[11] 0.40[12]	—	
John Ena[6]	KIRS	200	Robert Dollar Co.	300, **600**	P G	X	0.20[11] 0.40[12]	—	
John Englis	KDDJ	—	U.S. Shipping Board	—	P G	X	0.20	—	
John F. Hylan	KUSM	—	City of New York, Police Dept.	—	P G	—	—	—	
John Francis Burns[9]	NIGQ	—	Navy	300, **600**	P G	N	0.20[11] 0.40[12]	—	
John F. Reiss[5]	WNY	200	N. American S.S. Co.	300, **600**	P G	X	0.10	—	
John M. Connelly[6]	KJEI	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
John P. Reiss[5]	KUTM	—	North American S.S. Co.	—	—	—	—	—	
John R. Gibbons[5]	KURL	300	—	300, **600**	P G	X	0.20	—	
John Roach[5]	KOSN	—	U.S. Shipping Board	—	P G	X	0.20	—	
Johnson City[5]	KIKD	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
John Stevens	KDGM	—	U.S. Shipping Board	—	P G	X	0.20	—	
John Worthington	KDMN	—	—	—	—	—	—	—	
Jomar[5]	KUGT	—	U.S. Shipping Board	—	P G	X	0.20	—	
Jonancy[6]	KSEU	—	Pocahontas Fuel Co.	—	—	—	—	—	
Joseph Henry[6]	WXT	100	Government	600	O	X	—	—	
Joseph M. Cudahy	KDMT	—	Sinclair Navigation Co.	—	P G	X	—	—	
Joseph R. Parrott[5]	KJP	200	Florida E. Coast Car Ferry Co.	300, 450, **600**	P G	X	0.20[11] 0.40[12]	—	
Joseph Seep	KDJV	—	Standard Oil Co. of N.J.	—	P G	X	—	—	
Josiah Macy[5]	KEX	300	Standard Oil Co. of N.J.	300, 450, **600**	P G	—	0.20[11] 0.40[12]	—	
Jouett[9]	NIE	—	Navy	300, **600**	P G	N	0.20[11] 0.40[12]	—	
J. R. Gordon[6]	KOML	—	Union Sulphur Co.	—	—	—	—	—	
Julia Luckenbach[7]	KGZ	250	Luckenbach Co.	300, 450, 525, **600**	P G	X	0.40	—	
Juneau[7]	WAM	100	Alaska S.S. Co.	300, 550, **600**	P G	X	0.20	—	
Juniata KQJ[6]	KQJ	200	Merchants & Miners Transn. Co.	300, 450, **600**	P G	N	0.20[11] 0.40[12]	—	
Juniata WCB[6]	WCB	150	Great Lakes Transit Corporation	300, **600**	P G	N	0.10	—	

Juvigny	KUQX		Independent S.S. Co.	—	P G ..	X	[illegible]	—
J. W. Van Dyke [6] ..	KHR	250	Atlantic Refining Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
K1 [9]	NYF	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
K2 [9]	NYG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
K3 [9]	NYH	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
K4 [9]	NYI	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
K5 [9]	NYJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
K6 [9]	NYK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
K7 [9]	NYL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
K8 [9]	NYM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Kaleen [6]	KOKV	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Kalk [9]	NIGD	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Kalmia [9]	NAZS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Kamesit [7]	KEDG	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Kanak [6]	KOT	150	Alaska Packers Association ..	300, 400, 600	P R ..	X	0.20 [11] 0.40 [12]	—
Kanakee [7]	WVUU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Kanawha KYA [6] ..	KYA	—	John Borden	—	P G ..	—	0.20	—
Kanawha NND ..	NND	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Kane [9]	NULM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Kangi [7]	WRUA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Kaukankee [9]	NUMZ	—	—	300, 600	P G ..	N	—	—
Kansas NIO [9]	NIO	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Kasota [5]	KPAO	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Katherine [6]	KIZK	—	Philippine Veg. Oil Co.	—	—	—	—	—
Katia [6]	KZUA	200	Katra S.S. Corpn...	300, 600	P G ..	X	—	—
Katonah [7]	KERD	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Katrina Luckenback [6]	KWN	—	Luckenbach Company	—	—	—	—	—
Kaweah [5]	KOKL	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Kayseeka [3]	KOQS	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Kearny [7]	KOPR	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Kearsarge [9]	NIP	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Kehuku..	KUPV	—	U.S. Shipping Board	—	P G ..	N	0.20	—
Keketticut [3]	KZEA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Kekoskee	KDGY	—	U.S. Shipping Board	—	P G ..	—	0.20	—
Kennecott	KDPP	—	—	—	—	—	—	—
Kennedy [9]	NAZM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Kennison [9]	NEQX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Kenosha [7]	—	—	—	—	—	—	0.20	—	
Kenowis [5]	KOSV	—	U.S. Shipping Board	—	P G	X	0.20	—	
Kentuckian [8]	WKE	200	Amer.-Hawaiian S.S. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Kentucky NIQ	NIQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Keosanqua [9]	NEXC	—	—	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Keota [7]	WXAU	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Kerosaspa [6]	KQI	—	Kerr Nav. Corpn.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Kerhonkson [5]	KUJF	—	U.S. Shipping Board	—	P G	X	0.20	—	
Kermanshah [6]	KLX	—	Kerr Nav. Corpn.	300, **600**	P G	X	0.20 [11] 0.40 [13]	—	
Kermit [5]	WMV	100	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Kermoor [6]	WJB	—	Kerr Nav. Corpn.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Kershaw [6]	KQK	200	Merchants & Miners Trans. Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Keshena [6]	KITR	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Ketchikan [7]	WAE	100	Alaska S.S. Co.	300, **600**	P G	X	0.20 [11]	—	
Kewance [7]	KIVC	—	U.S. Shipping Board	300, **600**	P G	X	0 20	—	
Kidder [9]	NUJX	—	Navy	300, **600**	P G	N	0 20 [11] 0.40 [12]	—	
Kilkenny KKI [6]	KKI	100	Bureau of Navigation	300, 450, **600**	O	X	—	—	
Kilpatrick [6]	WXD	300	Army Transport	600	P G	N	—	—	
Kilty [9]	NAKX	—	Navy	300, **600**	P G	N	0.20 [11] 0 40 [12]	—	
K. I. Luckenbach [6]	KHY	—	Luckenbach Company	—	—	—	—	—	
Kimberly [9]	NADL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Kimta [3]	KIFS	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Kineo [5]	KPUI	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
King [9]	NULP	—	Navy	330, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Kingfisher KDNJ	KDNJ	—	Independent Oil Transportation Co.	—	P G	X	—	—	
Kingfisher KOOR [6]	KOOR	-	Kingfisher Co.	—	—	-	—	—	
Kingfisher NALP [9]	NALP	-	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	

			Lines					
							0.40 [12]	
Kiowa KDJP	KDJP	—	Independent S.S. Co.	—	P G	X		—
Kiron [6]	KITT	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Kishacoquillas [7]	KIFJ	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Kisnop [5]	KIJK	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Kitchi [6]	KITV	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Kittegaun [7]	KITG	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Kittery [9]	NHW	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Kivasind [9]	NNP	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Klamath WMOU [6]	WMOU	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Klingethoefer [9]	NISC	—	—	300, 600	P G	N	—	—
Knoxville [7]	KIJN	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Knudsen [9]	NEXL	—	—	300, 600	P G	N	—	—
Koka [9]	NETZ	—	—	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Kokomo [6]	KEJB	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Kolda [6]	KOKX	—	U.S. Shipping Board	—	P G	X	0.20	—
Kootenai [5]	KOGF	—	U.S. Shipping Board	—	P G	X	0.20	—
Kosciuszko	KZUE	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
K. R. Kingsbury [5]	KDRE	300	Standard Oil Co. of California, Inc.	300, 600	P G	X	0.40	—
Kroonland [8]	KSH	200	Internat. Mercantile Marine Co.	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Kukui [6]	NLF	100	Bureau of Lighthouses	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Kuwa [8]	WCEE	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Kvichak [6]	WNS	300	Alaska Packers Assn.	300, 600	P G	X	0.20 [11] 0.40 [12]	—
L1 [9]	NYN	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
L2 [9]	NYO	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
L3 [9]	NYP	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
L4 [9]	NYQ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
L5 [9]	NYR	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
L6 [9]	NYS	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
L7 [9]	NYT	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
L8 [9]	NYU	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
L9 [9]	NYV	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
L10 [9]	NYW	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
L11 [9]	NYX	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Labette [7]	KIZX	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Laborer [8]	KIST	—	U.S. Shipping Board	300, 600	P G	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Lackawanna Bridge [8] ..	KOGC	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lackawanna Valley [8] ..	KIXD	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
La Crosse [8] ..	KONM	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lafcomo [7]	KIXK	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Laforge [8]	WGAU	200	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Lake Agomak [7] ..	KZEU	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Akkra [8]	KVUE	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Allen [8]	KLEI	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Alvada [8]	KXAA	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Annette [7] ..	KKOE	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Arline [8]	KZOE	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Arthur [8]	WFL	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Lake Aurice [8]	KZIA	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Beacon [8] ..	WTAA	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Belnona [8] ..	KZII	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Benbow [8] ..	KVAE	—	U.S. Shipping Board	300, **600**	P G ..	—	0.20	—	
Lake Benton [8] ..	KSIU	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Berdan [8] ..	KZEE	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Blanchester [7] ..	KTIU	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Bledsoe [7] ..	KTUE	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Bridge [8]	KBAI	100	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Buckeye [8] ..	WSEU	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Butler [8]	WFN	200	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Lake Cahoon [8] ..	WKEE	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Calistago [7] ..	KXIU	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Callicoon [7] ..	WNAO	100	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Canaveral [7] ..	KIDS	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Candelaria [7] ..	KIJB	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Cannonsburg [7] ..	KIMV	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Capens [8] ..	KLUA	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Cathcoon [8] ..	WLEO	—	U.S. Shipping Board	300, **600**	P G ..	—	0.20	—	
Lake Catherine [8] ..	KSII	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Cayuga [8] ..	KLUI	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Charles [7] ..	KIIW	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Charlotte [8] ..	KQEO	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Charlottesville [8] ..	WNEA	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Chelan [7]	KQUO		U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Clear [7]	KI[illegible]		U.S. Shipping Board	300, **600**	P G ..	X	[illegible]		
Lake [illegible] [7]	KI[illegible]	150	U.S. Shipping Board ..	300, **600**	P G	X	[illegible]		

Lake Conesus [6] ..	KSAO	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Copley [6] ..	WKAU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Crescent [6] ..	WAP	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Crystal [5] ..	KLAO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Dancey [6] ..	KZEC	200	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Lake Daraga [6] ..	KRIA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Delancey [6] ..	KXAE	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Desha [6] ..	WTAE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Deval [7] ..	WKEA	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Duncan [6] ..	KSOO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Dunmore [6] ..	KBEI	100	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Dymer [8] ..	KZEI	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Eckhart [7] ..	KSOE	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Eliko [7] ..	KTAI	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Elizabeth [7] ..	WOP	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Elkwater [7] ..	KEPM	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Elkwood [7] ..	KENP	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Ellendale [6] ..	KEPN	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Ellenorah [7] ..	KEPP	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Ellerslie [8] ..	KEQM	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Ellicott [6] ..	KEQN	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Ellijay [6] ..	KOBL	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Ellithorpe [8] ..	KOFM	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Ellsbury [6] ..	KOFP	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Ellsworth [6] ..	KOCZ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Elmdale [5] ..	KOLR	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Elmhurst [5] ..	KOFQ	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Elmont [6] ..	KOQG	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Elmsford [6] ..	KOVG	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Elmwood [6] ..	KOZT	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Elon [7] ..	KOBZ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Elpueblo [6] ..	KOFV	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Elrio [5] ..	KOKQ	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Elsah [6] ..	KOSR	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Elsinore [6] ..	KRII	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Elsmere [6] ..	KONT	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Elva [6] ..	KUBR	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Elwin [6] ..	KUDM	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Ennis [5] ..	KLUO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Fablus [6] ..	KIPQ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Fabyan [6] ..	KINJ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Fackler [6] ..	KIQP	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Fagundus [6] ..	KISN	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Fairfax [6] ..	KIRV	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Fairlie [6] ..	KISP	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Fairport [6] ..	KOGR	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Falama [6] ..	KITB	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Falun [6] ..	KOTB	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Fanbush [7] ..	KEJN	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake Fandango [6] ..	KOVL	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Fandon [6] ..	KOVS	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Fannin [8] ..	KECN	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—	
Lake Fanquier [6] ..	KEKN	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—	
Lake Fansdale [6] ..	KEKM	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—	
Lake Farabee [5] ..	KEBP	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Lake Farber [7]	KIRB	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Faresman [7]	KEVZ	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Farge [3]	WLEA	100	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Faribault [7]	KEDM	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Lake Faristell [3]	WLEE	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Fariston [6]	KEDN	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Lake Farley [6]	KEDP	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Lake Farlin [5]	KIGM	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Lake Farmingdale [7]	KIPZ	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Farragut [5]	KIQN	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Farrar [5]	KISX	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Lake Faulk [5]	KEJP	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Favonia [3]	KOJP	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Faxon [5]	KOLJ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Fear [6]	KIVM	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Felden [5]	KOLK	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Fenn [6]	KOTT	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Feodora [6]	KUBT	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Fernalda [6]	KOPB	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Fernando [3]	KELM	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Fernwood [3]	KDEA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Ferrona [6]	KELN	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Lake Festinia [6]	KEQP	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Festus [7]	KERM	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Fibre [3]	KERN	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Fielding [3]	KERP	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Lake Fife [3]	KESM	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Lake Figaret [6]	KESN	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Fighting [6]	KESP	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Filbert [6]	KONV	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Fillion [6]	KOPV	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Fillmore [6]	KUCZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Fiscus [5]	KOCG	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Fisher [6]	KODD	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Fitch [6]	KOJQ	—	U.S. Shipping Board		P G	X	0.20	—	
Lake Fithian [3]	KOKZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Flag	KUMX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Flagon [3]	KIXT	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Flagstaff [3]	KIZM	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	

Lake Flanders [5]	KOGT	—	U.S. Shipping Board	—	P G	X	0.20	—
Lake Flatonia [5]	KOGS	—	U.S. Shipping Board	—	P G	X	0.20	—
Lake Flattery [5]	KOMC	—	U.S. Shipping Board	—	P G	X	0.20	—
Lake Floravista [6]	KUFC	—	U.S. Shipping Board	—	P G	X	0.20	—
Lake Florian [6]	KUFD	—	U.S. Shipping Board	—	P G	X	0.20	—
Lake Floris [6]	KUFF	—	U.S. Shipping Board	—	P G	X	0.20	—
Lake Flournoy [6]	KUFG	—	U.S. Shipping Board	—	P G	X	0.20	—
Lake Flovilla [5]	KESK	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Flume [7]	KMUU	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Flushing [7]	KEBV	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fluvanna [3]	WLAU	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Flynus [7]	KECV	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Folcroft [5]	KEXL	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fonda [3]	KEZC	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fondulac [5]	WSEO	150	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fontana [3]	KEZD	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fontanet [5]	KEZF	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Forkville [3]	WLEI	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Forney [3]	WBUU	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Forsby [5]	WCUA	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fossil [5]	WCUE	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fostoria [5]	WPIO	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fouche [3]	WPIU	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Foxboro [5]	KESB	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Foxcraft [7]	KEGL	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fraichur [3]	KEJG	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fraley [3]	KEJJ	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Frances [6]	KTAO	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Franconia [5]	WCUO	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fray [7]	WCUU	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Frazee [5]	WDUA	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Freeborn [7]	WDUI	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Freed [5]	WDUO	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Freeland [3]	WDUU	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Freezout [5]	WFUA	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Frenchton [5]	WFUE	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Fresco [5]	WNAU	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Friar [7]	KEFN	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Frio [3]	KEFP	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Frohna [7]	KEGR	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Lake Frolono [3]	KEGN	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Lake Frugality [5]	KEGP	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Frumet [5]	KIRJ	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Lake Fugard [3]	WLEU	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Furley [3]	WMAA	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Furlough [5]	KEKP	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Furnas	KUTV	—	U.S. Shipping Board	—	P G	X	0.20	—
Lake Gadsden [5]	KITP	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Gaither [6]	KOJZ	—	U.S. Shipping Board	—	P G	X	0.20	—
Lake Gakona [7]	KVOU	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Lake Galata [5]	KOJJ	—	U.S. Shipping Board	—	P G	X	0.20	—
Lake Galera [7]	KXAI	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lake Galewood [6]	KOJX	—	U.S. Shipping Board	—	P G	X	0.20	—
Lake Galien [6]	KOJT	—	U.S. Shipping Board	—	P G	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Lake Galisteo	KUGL	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Galucus	KUMV	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Ganado	KUMB	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Gano	KDGR	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Gardner [5]	KXEO	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Garza [3]	KVOE	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Gasper [5]	KVOI	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Gatun	KDKP	—	Saginaw Shipbuilding Co.	—	P G	X	—	—	
Lake Gazette [5]	KIPN	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Gebhart [6]	KOGV	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Gedney [7]	KVUO	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Geneva [5]	KXUA	150	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake George [3]	KBEO	100	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Gera [6]	KOKS	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Gert [6]	KOMB	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Getaway [6]	KOLZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Geyser	KULD	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Giddings [6]	KUCR	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lake Gilboa [3]	KEZJ	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Gilpen [5]	KEZK	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Gilta [6]	KEZL	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Giltedge [7]	KEBM	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Girardeau [6]	KOCS	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Girth [3]	KEBN	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Gitano [7]	KECM	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Lake Glasco [6]	KINK	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Lake Glebe [7]	KIBB	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Glencoe [3]	KIGB	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Gorin [3]	WRIE	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Gormania [6]	WVIA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Govan [3]	WVIU	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Gradan [7]	WSUU	150	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Grainger [6]	KEJK	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Grama [5]	KEJL	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Gramplan [6]	KEKG	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Grampus [6]	KEKJ	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Lake Granby [6]	KIDB	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
[illegible] [6]	WIAI	200	U.S. Shipping Board	300, **600**	P G	X	0.20		
[illegible] [6]	WZOA	[illegible]	U.S. Shipping Board	300, **600**	P G	X	0.20		

Lake Grattan [5]	WZOI	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Lake Gravella [7] ..	WZOO	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Gravett [8]	WZOU	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Gravity [8]	WBUA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Greenbrier [7] ..	WBUE	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Lake Gretna [5]	—	—	---	—	—	—	0.20	—
Lake Grogan [7] ..	WBUO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Gunni	KUNC	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Lake Haresti	KUGN	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Lake Harminia ..	KUNB	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Lake Harney [5] ..	KGOE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Harris [3]	KXAU	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Hector	KUMZ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Lake Helen [3]	KZOI	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Hemlock [5] ..	KLOE	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Hewes [7]	KVUU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Hurst [7]	KLOI	200	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Lake Ikatan [8]	KUCM	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Lake Inaha [8]	KEFM	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Indian [7]	KZOO	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Inglenook [3] ..	KOBT	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Janet [7]	KFD	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Jessup [8]	KHV	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Lake Kyttle [7]	WCOU	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lakeland WDL [3] ..	WDL	—	Tri-State S.S. Co...	—	P G ..	X	0.10	—
Lake Larga [7]	KMUE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Lasang [5] ..	KMUA	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Ledan [7]	KTUA	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Lemando [8] ..	WCIO	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Lesa [7]	KXOU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Licoco [7]	WTAO	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Lida [5]	KLOO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Lilicusun [7] ..	KZIO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Lillian [3]	KXUI	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Linden [5] ..	KZAE	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Louise [5]	KZUU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Marion [5] ..	KXEE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Markham [5] ..	KTOU	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Mary [5]	KREO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Mattato [8] ..	WTAI	100	U.S. Shipping Board	300, 600	P G .	X	0.20	—
Lake Maurepas [5] ..	KLEA	—	U.S. Shipping Board	300, 600	P G .	X	0.20	—
Lake Medford [5] ..	KZOA	200	U.S. Shipping Board	300, 600	P G .	X	0.20	—
Lake Mirafcores ..	KDNR	—	U.S. Shipping Board	—	P G .	X	0.20	—
Lake Narka [8]	KTOA	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Ogden [8]	KHU	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Onawa [3]	KOJM	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Lake Ontario [5] ..	KBAA	100	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Orange [5] ..	KZOU	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Ormoc [8]	KVUA	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Osweya [8] ..	KVAA	150	U.S. Shipping Board	300, 450, 600	P G ..	X	0.20	—
Lake Otisco [5]	KLIA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Otsquago [7] ..	KXAO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Lake Pachuta [7] ..	KTUU	200	U.S. Shipping Board	300, 600	P G .	X	0.20	—
Lake Pearl [5]	KVIO	200	U.S. Shipping Board	300, 600	P G .	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per-Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Lake Pepin[5]	KTUI	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Pewaukee[3] ..	KLEU	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Pickaway[3] ..	WKAO	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Pleasant[7] ..	KXEA	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Saba[3]	KOS	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Sanford[3] ..	KXEI	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Sapor[5]	KEZB	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Savus[3]	KOCB	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Sebago[5] ..	KLUE	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Shawano[3] ..	KLOU	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lakeshore[5]	KBAU	100	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Silver[3]	KHE	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Singara[7] ..	KITQ	300	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Sl[illegible][6]	KOTJ	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake St. Clair[7] ..	WNL	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Sterling[5] ..	KBUE	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Lake Strabo[7]	KEBR	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Lake St. Regis[7] ..	KLEE	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Strymon[6] ..	KONS	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Sunapee[6] ..	KLIU	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Superior[7] ..	KBAO	100	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Tippah[6]	KOVC	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Traverse[3] ..	KBUA	—	Amer.-Hawaiian S.S. Co.	300, **600**	P G ..	X	0.20	—	
Lake Treba[6]	KOSQ	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Lake Tulare[7]	WDX	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lakeview[5]	KBEE	100	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Ville[3]	KXEU	—	U.S. Shipping Board	300, **600**	P G ..	—	0.20	—	
Lake Washburn[7] ..	KREI	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Weir[6]	KBEA	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Wilson[6]	KZAO	100	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Winnico[3] ..	KSOI	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Winona[6]	KLAU	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Winooski[7] ..	KZIE	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Winthrop[6] ..	KZAI	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lakewood KBOO[6] ..	KBOO	100	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Yahara[7] ..	KZAU	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Yelverton[6] ..	KVOO	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Yemassee[6] ..	KTOO	150	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Lake Ypsilanti[6] ..	WKEI	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	

Lake Zaliski[3]	WRAT	200	U.S. Shipping Board	300, 600	P G	X		
Lamberton[9]	NAZL	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Lambs (The)[3]	KEBZ	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lampasas[5]	KEP	200	Malory S.S. Co.	300, 450, 600	P G	N	0.20[11] 0.40[12]	—
Lamson[9]	NUNC	—	—	300, 600	P G	N	—	—
Lancaster KQUE[3]	KQUE	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Lansdale[9]	NERL	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Lansdowne[5]	KONP	—	U.S. Shipping Board	—	P G	X	0.20	—
Lansing[1]	WTC	150	Union Oil Co. of Calif.	300, 600, 1,800	P G	X	0.20[11] 0.40[12]	—
La Placentia	KDPX	—	Union Oil Co.	—	P G	X	—	—
Lapwing[9]	NALC	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Laramie KUBC[7]	KUBC	—	U.S. Shipping Board	—	P G	X	0.20	—
Laramie NUGL[9]	NUGL	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Lardner[9]	NUPF	—	—	300, 600	P G	N	—	—
Lark[9]	NIJK	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Larkspur[9]	NAMB	—	Bureau of Lighthouses	300, 600	P G	N	0.20[11] 0.40[12]	—
Larsen[9]	NITK	—	—	300, 600	P G	N	—	—
Las Vegas[5]	KUQM	—	U.S. Shipping Board	—	P G	X	0.20	—
Latham	KUKR	—	U.S. Shipping Board	—	P G	X	0.20	—
Latoka[7]	WLUA	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Latouche[7]	WAI	100	Alaska S.S. Co.	300, 600	P G	X	0.20	—
Laub[9]	NIGJ	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Laurel NALV[4]	NALV	—	Bureau of Lighthouses	300, 600	P G	N	0.20	—
Laurel WTUE[3]	WTUE	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lavada	KDFV	—	U.S. Shipping Board	—	P G	—	0.20	—
Lea[9]	NETF	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Leary[9]	NAFL	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Lebanon KIXL[3]	KIXL	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lebanon NIZ[9]	NIZ	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Lehigh[7]	KINM	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lenape[5]	KVL	200	Clyde S.S. Co.	300, 450, 600	P G	N	0.20[11] 0.40[12]	—
Leonidas[9]	NNH	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Levi, G. Burgess[5]	WCX	200	Alaska-Portland Packers Assn.	300, 450, 600	P G	N	0.20 0.40	—
Leviss[8]	KDL	300	United Fruit Co.	300, 600	P G	X	0.40	—
Lewis K. Thurlow[9]	KXY	200	Crowell and Thurlow S.S. Co.	300, 450, 600	P G	X	—	—
Lewis Luckenbach[7]	WFOE	—	Luckenbach Co.	—	—	—	0.20	—
Lewiston[3]	WSOU	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lexington KNB[4]	KNB	50	Colonial Nav. Co.	300, 550, 600	P G	N	0.15	—
Lexington NEDB[9]	NEDB	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Libby Maine [7]	KDV	300	Libby McNeil and Libby	300, 450, 535, **600**	P G	X	0.20 0.40	—	
Liberator [7]	KRIU	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Liberty WCOO [7]	WCOO	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Liberty Bell	KUJX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Liberty Land [3]	KISS	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Liberty Minquas [7]	KUBJ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Liebre	KDPG	—	General Petroleum Corporation	—	P G	X	—	—	
Lieut. Geo. M. Harris [6]	WYR	30	U.S. Army Signals	400	O	X	—	—	
Lieut. Harold G. Douglas	WYBQ	—	—	300, **600**	P G	N	—	—	
Lieut.-Col. Herman C. Schumm [8]	WYBS	—	—	300, **600**	P G	N	—	—	
Lieut.-Col. Robert C. Gildart [6]	WYBR	—	—	300, **600**	P G	N	—	—	
Lightburne [8]	KIVF	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Ligonier [5]	KTD	200	Gulf Refining Co.	300, **600**	P G	X	0.20 [11]	—	
Lilac [6]	NUCF	—	Bureau of Lighthouses	300, **600**	P G	N	0.20 [11] 0.40 [12]	— —	
Lilmar	KDHU	—	United States-Mexican Oil Corp.	—	P G	X	—	—	
Limit (The) [5]	WCV	100	Whitney Bros. Co.	300, **600**	P G	X	0.10	—	
Limon [6]	KDR	125	United Fruit Co.	300, 450, **600**	P G	X	0.40	—	
Liscum [6]	WXE	300	U.S. Army Signals	600	P G	N	0.20 [11] 0.40 [12]	—	
Litchfield [1]	NUMM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Lithopolis [8]	WQEA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Little [6]	NRT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Livingstone [8]	KDOY	—	Tri-State S.S. Co.	—	P G	X	—	—	
Livingstone Roe	KDOD	—	Standard Oil Co. of N.Y., Incorp.	—	P G	X	—	—	
L. J. Drake [8]	WZAA	300.	Standard Oil Co. of N.J.	300, **600**	P G	N	0.20 [11]	—	
Lockport [8]	KIXM	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Logan [6]	WXF	300	U.S. Army Signals	600	P G	N	0.20	—	
Loki KDGD	KDGD	—	U.S. Shipping Board	—	P G	X	0.20	—	
Lone Star [8]	KZUO	150	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Long [6]	NEPD	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Long Beach [6]	NLEZ	—	—	300, **600**	P G	N		—	
[illegible]onoka [8]	KPOI	200	U.S. Shipping Board	300, **600**	P G	X	[illegible]		

[illegible]	[illegible]	—	[illegible] Coast Fisheries Co.	—	P G	X	—	—
Lorain [5]	KIEZ	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lordship Manor [5]	KIXN	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lorraine Cross [3]	KDDE	—	U.S. Shipping Board	—	P G	X	0.20	—
Louise [5]	KUKN	—	F. D. Burge	—	P G	X	—	—
Louisiana KUL [5]	KUL	300	Texas Company	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Louisiana NJB [9]	NJB	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Louisville Bridge [5]	KIDP	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
L. Roscoe [6]	NZX	150	Alaskan Engineering Commission	300, 600	O	X	—	—
Luce [9]	NEGD	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Ludlow [9]	NENZ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Luella [5]	KLAA	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lurline [5]	WML	150	Matson Nav. Co.	300, 450, 600	P G	N	0.20 [11]	—
Luxpelile [5]	KIPV	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Lycoming [5]	KOMK	—	U.S. Shipping Board	—	P G	X	0.20	—
Lydia WROI [5]	WROI	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Lydonia [9]	NDR	—	—	300, 600	P G	N	—	—
Lyman Stewart [1]	WTL	150	Matson Nav. Co.	300, 600, 1,800	P G	X	0.20 [11] 0.40 [12]	—
Lyndonia	KULZ	—	C. H. K. Curtis	—	P G	X	—	—
Luzon	KDRU	—	Fernandez Hermanos	—	—	—	—	—
Mi [9]	NYY	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
M. A. Bradley [5]	WQH	200	Harvey H. Brown & Co.	300, 600	P G	X	0.10	—
Machenzie [9]	NEVX	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Machias [9]	NQL	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Machinac [9]	NUGD	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
MacLeish [9]	NUPT	—	—	300, 600	P G	N	—	—
Macomet [5]	KORC	—	U.S. Shipping Board	—	P G	X	0.20	—
Maddequet	KUGZ	—	U.S. Shipping Board	—	P G	X	0.20	—
Maddox [9]	NETX	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Madrona [9]	NAMV	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Magmeric [7]	KOJS	—	U.S. Shipping Board	—	P G	X	0.20	—
Magnolia NAPS [9]	NAPS	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Magunkook [5]	WJUO	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Mahan [9]	NEQK	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Mahanna [5]	KKP	—	U.S. Shipping Board	300, 600	P G	N	0.20	—
Mahaska [5]	—	—	—	—	—	—	0.20	—
Mahnet [5]	KFM	—	U.S. Shipping Board	300, 600	P G	N	0.20	—
Mahopac NETD [9]	NETD	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Maiden Creek [5]	KIPX	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Maine KUQ [5]	KUQ	200	U.S. Shipping Board	300, 450, 600	P G	X	0.20	—
Maine NJL [9]	NJL	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Maitland No. 1[5]	WLE	100	Harvey H. Brown & Co.	300, **600**	P G	X	0.10	—	
Major Albert G. Gorse[6]	WYQ	30	Bureau of Lighthouses	1,200	O	X	—	—	
Major Albert G. Jenkins	WYBV	—	—	300, **600**	P G	N	—	—	
Major Carl A. Lohr[6]	WYBT	—	—	300, **600**	P G	N	—	—	
Major Evan Thomas[6]	WYO	35	Bureau of Lighthouses	300	O	X	—	—	
Major Guy Howard[6]	WZY	100	Bureau of Lighthouses	400	O	X	—	—	
Major John W. McKie[6]	WYBX	—	—	300, **600**	P G	N	—	—	
Major Lester E. Moreton[6]	WYBU	—	—	300, **600**	P G	N	—	—	
Major Samuel Ringgold	WYC	100	Navy	300	O	X	—	—	
Major Wheeler[7]	WFII	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Major William P. Pence[6]	WYBW	—	—	300, **600**	P G	N	—	—	
Makanda[7]	KPUA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Malden[5]	KZV	200	New England Fuel & Transn. Co.	300, 450, **600**	P G	X	0.20[11] 0.40[12]	—	
Mallard NIKB[6]	NIKB	—	Navy	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Manada[7]	KNOA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Manatawny	KDFM	—	U.S. Shipping Board	—	P G	X	0.20	—	
Manatee	KURN	—	U.S. Shipping Board	—	P G	X	0.20	—	
Manchuris[6]	WWE	300	International Mercantile Marine Co.	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Mangore[6]	KHP	200	Ore S.S. Company	300, 450, **600**	P G	X	0.20[11] 0.40[12]	—	
Mangrove[6]	NANS	—	Navy	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Manham[3]	KORS	—	U.S. Shipping Board	—	P G	X	0.20	—	
Manhattan NEKZ[6]	NEKZ	—	U.S. Coastguard Dept.	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Manitou WFW[5]	WFW	150	Northern Mich. Transportation Co.	300, **600**	P G	N	0.10	—	
Manitowoc[7]	KRQ	275	American Transatlantic Co.	300, 450, 525, **600**	P G	X	0.20[11]	—	
Manley[6]	NSH	—	Navy	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Mannahocking[6]	KEZX	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Manning[6]	NRN	150	U.S. Coastguard Dept.	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Manoa KOQ[6]	KOQ	—	American Interlake Co.	—	—	—	0.20	—	
Manoa WMQ[6]	WMQ	200	Matson Nav. Co.	300, 450, **600**	P G	N	0.20[11] 0.40[11]	—	

Maple NAPV [4] ..	NAPV	—	U.S. Bureau of Lighthouses ..	300, 600	O ..	X	0.20 [11] 0.40 [12]	—
Maquan [5]	KOVD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Maracaibo [5]	KDM	300	Atlantic & Caribbean S.N. Co. ..	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Maracay	KDKO	—	Caribbean Trading Co.	—	—	—	—	—
Maratanza [7]	WCEI	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Marblehead [9]	NGK	—	—	300, 600	P G ..	N	—	—
Marcus [9]	NUMG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Margaret KUQS ..	KUQS	—	Red Salmon Canning Co. ..	—	P G ..	—	—	—
Margaret KZO [6] ..	KZO	200	A. H. Bull S.S. Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Margus [5]	KONG	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Marica [7]	KNK	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Marigold [9]	NAQV	—	Navy	300, 600	O ..	X	0.20 [11] 0.40 [12]	—
Marina KIVD [6] ..	KIVD	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Mariners Harbour [5] ..	KKEU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Marne KDLV	KDLV	—	U.S. Shipping Board	—	P G ..	N	0.20	—
Marquette and Bessemer No. 2 [6]	WEX	125	U.S. Shipping Board	300, 425, 540, 600	P G ..	X	0.10	—
Mars [9]	NJR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Marshfield [5]	KECC	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Marsodak [7]	KOCM	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Martha Washington [7] ..	KUQF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Maruba [6]	WZEE	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Mary [3]	KTOE	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Maryland NARC [9] ..	NARC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Mary Luckenbach ..	KDLX	—	Luckenbach Terminals	—	P G ..	X	—	—
Masca [3]	KIBL	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Mascotte [5]	KOW	150	Peninsular & Occidental S.S. Co.	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Mason [9]	NAGG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Mason City [7]	KUGX	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Massachusetts [9] ..	NJT	—	Navy	300, 600	P G ..	/	0.20 [11] 0.40 [12]	—
Massick [7]	KOPF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Massillon Bridge [3] ..	KONJ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Masuda [7]	KMII	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Matanzas [3]	WFEU	200	N.Y. & Cuba Mail S.S. Co. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Matinicock [5]	KID	200	Standard Oil Co. of N.J.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Matsonia [5]	WMP	150	Matson Nav. Co.	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Mattapan [3]	WCEO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Mattole KUSV ..	KUSV	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Mattole NUGM [9] ..	NUGM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Mindanao*	KRAE	—	Cia de Tabocas del Filippines	—	—	—	—	—	
Maui*	WMR	300	Matson Nav. Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Maumee*	NNE	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Mauna Kea*	KDPD	—	Inter Island S.N. Co.	—	P G	X	0.20	—	
Maury*	NEPG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Mayflower NJV*	NJV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Mayflower NZQ*	NZQ	—	Bureau of Lighthouses	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Mayrant*	NJU	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Mazama*	KNUO	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Mazatlan KUBQ*	KUBQ	—	California-Mexico S.S. Co.	—	P G	X	—	—	
McCall*	NJW	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
McCalla*	NIGC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
McCawley*	NULS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
McClellan*	KYF	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
McCook*	NIGB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
McCormick*	NUPZ	—	—	300, **600**	P G	N	—	—	
McCreary County*	KOQP	—	U.S. Shipping Board	—	P G	X	0.20	—	
McDermut*	NIGG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
McDougal*	NIT	—	—	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
McFarland*	NETB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
McGourty*	NEJV	—	—	300, **600**	P G	N	—	—	
McKean*	NEMT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]		
McKee*	NACQ		Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
McKeesport*	KENB	[illegible]	U.S. Shipping Board	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	

Meade [9]	NEBJ	—	Navy	300, 600	P G ..	N	0.40 [12] 0.20 [11] 0.40 [12]	—
Meanticut	KDQH	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Medford [7]	WRUE	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Medina [3]	KEI	300	Mallory S.S. Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Medon	KDID	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Medric [6]	KURQ	—	East Coast Fisheries Co. ..	—	P G ..	X	—	—
Medusa NEMC [9] ..	NEMC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Mehalatos [9]	NIDL	—	—	300, 600	P G ..	N	—	—
Mehanno [5]	KUDJ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Melrose [5]	KZW	300	New England Fuel & Transportation Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Melville NKA [9] ..	NKA	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Melvin [9]	NURC	—	—	300, 600	P G ..	N	—	—
Memnon KDMH ..	KDMH	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Memphis NISS [9] ..	NISS	—	—	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Mendora [6]	KIKN	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Menominee KODL [9] ..	KODL	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Mercer [5]	KEPF	—	Alaska-Portland Packer's Assn. ..	300, 600	P G ..	—	0.20	—
Mercer Victory [3] ..	KIVG	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Mercy [9]	NKK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Meredith [9]	NETS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Meriden [5]	KILP	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Merrimack [5]	KQM	200	Merchants & Miners Transportation Co.	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Merritt [9]	WXI	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Merry Mount [7] ..	KOGX	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Metapan [6]	KLF	500	United Fruit Co.	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Mevania [5]	KDCU	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Mexican [3]	WKL	350	Amer.-Hawaiian S.S. Co. ..	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Mexicano KGM [6] ..	KGM	200	Pierce Oil Corporation	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Mexico KWX [3] ..	KWX	200	N.Y. & Porto Rico S.S. Co. ..	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Mexoil [6]	WQIA	—	Pan-Amer. Petroleum & Trans. Co	300, 600	P G ..	X	—	—
Meyer [9]	NUJR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
M. F. Elliott	KDNK	—	Standard Oil Co.	—	P G ..	X	—	—
Miami [5]	KOZ	150	Peninsular & Occidental S.S. Co.	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Michigan NJZ [9] ..	NJZ	—	Navy	300. 600	P G ..	N	0.20 [11] 0.40 [12]	—
Middlebury [6]	KZAA	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Middlesex WRO [6] ..	WRO	—	Coastwise Transportation Co. ..	300. 600	P G ..	X	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Miller County [6]	KERX	—	U.S. Shipping Board	300, **600**	P G ..	—	—	—	
Millinocket [5]	KNM	200	A. H. Bull S.S. Co.	300, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Milwaukee KEXS [5] ..	KEXS	—	Grand Trunk Car Ferry Line ..	300, **600**	—	X	—	—	
Milwaukee NISM [9] ..	NISM	—	—	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Milwaukee Bridge [5] ..	KIBF	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Mindoro	KDRS	—	Philippine Insular Govt... ..	—	—	—	—	—	
Mineola [7]	KSEE	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Minneapolis [9]	NGB	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Minnekahda KDKK [5]..	KDKK	—	Atlantic Transport Co.	—	P G ..	N	—	—	
Minnequa [5]	KIVB	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Minnesota NKD [9] ..	NKD	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Minnesota WEK [5] ..	WEK	150	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Minnesota WMI [5] ..	WMI	150	Internat. Mercantile Marine Co.	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Minnesotan [5]	WKM	200	Amer.-Hawaiian S.S. Co. ..	300, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Minnewawa [5]	KPGO	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Minooka [5]	KOZN	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Miskianza [5]	KOZM	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Mississippi NKE [9] ..	NKE	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Missouri NKF [9] ..	NKF	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Missouri WFX [5] ..	WFX	125	Northern Mich. Transportation Co.	300, **600**	P G ..	N	0.10	—	
Mitchell [5]	KOTF	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
M. J. Scanlon [7] ..	WJAO	300	U.S. Shipping Board	300, 450, **600**	P G ..	X	0.20	—	
Moffitt	KDME	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Mohave [9]	NTO	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Mohawk KVM [5] ..	KVM	200	Clyde S.S. Co.	300, 450, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Mohawk KXE [5] ..	KXE	50	New England S.S. Co.	300, **600**	P G ..	N	0.15	—	
Mohawk NRM [9] ..	NRM	—	U.S. Coast Guard Dept. ..	300, **600**	P G ..	N	0.20 [11] [illegible]	—	

Mohawk NUFB[9]	NUFB	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Mohegan[4]	KXM	50	New England S.S. Co.	300, 550, 600	P G ..	N	0.15	—
Moninkis[5]	KUKP	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Mojave[7]	WJEA	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Moline[5]	KEXN	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Momus[5]	KKM	300	U.S. Shipping Board	300, 450, 600	P G ..	N	0.20[11] 0.40[12]	—
Monadnock NHD[9] ..	NHD		Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Monaha[7]	KFEO	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Monasses[3]	KILX	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Mongolia[6]	WWN	250	Atlantic Transport Co.	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Monmouth WXUO[3] ..	WXUO	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Mono[7]	WBOA	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Monocacy[9]	NQQ	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	
Monomac[3]	KORP	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Monroe[6]	KOSF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Montague[3]	KOMV	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Montauk[9]	NARN	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Montcalm NEQF[9] ..	NEQF	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Montclair[3]	KVII	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Montebello KDPR[5] ..	KDPR	—	Union Oil Co.	—	P G ..	X	0.40	—
Monterey KWY[3] ..	KWY	200	N.Y. & Cuba Mail S.S. Co. ..	300, 450, 600	P G ..	N	0.20[11] 0.40[12]	—
Monterey NKN[9] ..	NKN	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Montfaucon	KUQZ	—	Independent S.S. Co.	—	P G ..	X	—	—
Montgomery KIJP[7] ..	KIJP	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Montgomery NAXJ[9]	NAXJ	—	Navy	300, 600	P G ..	N	0.20	—
Montgomery City ..	KDJZ	—	U.S. Steel Products Co.	—	P G ..	N	—	—
Monticello[3]	WLJ	100	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Montpelier[4]	WLKZ	300	U.S. Shipping Board	300, 450, 600	P G ..	N	0.20	—
Montrolite[5]	WEO	—	Standard Oil Co. of N.J.	300, 600	P G ..	—	—	—
Moody[9]	NULT	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Moonlite[5]	KPL	100	Standard Oil Co. of N.J.	300, 450, 600	P G ..	X	0.20[11] 0.40[12]	—
Moosabee[5]	KIKP	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Moosehausic[3]	KOGD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Moositauke[6]	KOKG	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Mopang[3]	KOPX	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Moraine[3]	KPEU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Moravia Bridge[6] ..	KOZG	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Morganza[3]	KEGB	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Moritz[7]	KPEO	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Morrill[6]	NRC	100	U.S. Coastguard Dept.	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Morris[9]	NWS	—	Navy	300, 600	P G ..	N	0.20[1] 0.40[12]	—
Morristown[7]	WGAI	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Morro Castle [3]	KWC	300	N.Y. & Cuba Mail S.S. Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Mosella	KDCQ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Moshico [5]	KOBX	—	U.S. Shipping Board	—	P G	X	0.20	—	
Moss Point [7]	KETJ	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Mount Baker [5]	KYD	300	Gaston Williams & Wigmore S.S. Corpn.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Mount Carroll	KDQT	—	Shawmut S.S. Co.	—	P G	N	—	—	
Mount Clay	KDBX	—	American Ship and Commerce Navigation Corporation	—	P G	N	0.20	—	
Mount Clinton	KDRV	—	Shawmut S.S. Co.	—	P G	N	—	—	
Mount Evans [7]	KIMT	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Mount Hope [8]	KOL	25	U.S. Shipping Board	300	P	X	—	—	
Mount Rainier [6]	WSOE	175	Gaston Williams & Wigmore S.S. Corpn.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Mount Seward [5]	WJC	—	Kerr Navigation Corporation	300, **600**	P G	X	0.40	—	
Mount Shasta [5]	WHH	200	U.S. Shipping Board	300, 450, **600**	P G	X	0.20	—	
Mount Sidney [5]	KQP	150	American Ship and Commerce Navigation Corporation	300, **600**	P G	X	0.20	—	
Mount Sterling [5]	WGW	—	American Ship and Commerce Navigation Corporation	300, **600**	P G	X	0.20	—	
Mount Summit [5]	WPJ	—	American Ship and Commerce Navigation Corporation	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Mount Vernon [9]	WUAA	—	—	300, **600**	P G	N	—	—	
Mt. Vernon Bridge [9]	KWA	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Mugford [9]	NEXR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Mullany [9]	NUML	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Mulpua [7]	KIDJ	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Multnomah [5]	WMA	150	Chas. R. McCormick & Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Munaires [6]	WJN	—	Munson S.S. Lines	300, **600**		—	—	—	
Munalbro [5]	KUX	—	Munson S.S. Lines	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Munamar [6]	KUI	200	Munson S.S. Lines	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Mundale [6]	KUJ	200	Munson S.S. Lines	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	

Mundo (El) [5]	KKU	200	Southern Pacific Co.	300, 600	P G	X	0.40 [12] 0.20 [11] 0.40 [12]	—
Munindies [5]	KVE	—	Munson S.S. Lines	300 600	P G	—	—	—
Munisla [5]	KJO	200	Munisla S.S. Corporation	300, 600	P G	X	0.20	—
Munplace [5]	KUG	200	Munson S.S. Lines	300, 450, 600	P G	X	0.20 [11] 0.40 [14]	—
Munra [6]	WDAA	—	Munson S.S. Lines	300, 600	P G	X	—	—
Munrio [5]	KVD	—	Munson S.S. Lines	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Munsomo [5]	KUK	200	Munson S.S. Lines	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Munwood [5]	KUH	200	Munson S.S. Lines	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Muriel	KDMO	—	Muriel Motorship Corporation	—	P G	X	—	—
Murray [9]	NAXK	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Mursa	KDFT	—	U.S. Shipping Board	—	P G	—	0.20	—
Muscatine [7]	KJII	—	U.S. Shipping Board	300, 600	P G	N	0.20	—
Muskegon	KDGP	—	Am. Transatlantic Co., N.Y.	—	P G	—	—	—
Musketo [5]	WDAE	—	U.S. Shipping Board	300, 600	P G	N	0.20	—
Muskoges [5]	KIB	300	Standard Oil Co. of N.J.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Mystic [3]	KHZ	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
N.1 [9]	NZE	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
N.2 [9]	NZF	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
N.3 [9]	NZG	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
N.4 [9]	NZH	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
N.5 [9]	NZI	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
N.6 [9]	NZJ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
N.7 [9]	NZK	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Naamhok	KDNE	—	U.S. Shipping Board	—	P G	X	0.20	—
Nacata	KDMM	—	U.S. Shipping Board	—	P G	X	0.20	—
Nacogdockes [6]	KKIU	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Nacooches [5]	KFP	300	Ocean S.S. Co. of Savannah	300, 450, 600	P G	N	0.20 [11] 0.40 [12]	—
Naiwa [5]	WCIU	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Namasket	KDMI	—	U.S. Shipping Board	—	P G	X	0.20	—
Nameaug [7]	KITN	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Nanking [5]	KKEE	300	China Mail S.S. Co.	300, 450, 600	P G	N	0.20 [11] 0.40 [12]	—
Nansemond [8]	WQR	300	U.S. Shipping Board	300, 450, 600	P G	N	0.20	—
Nanshan [9]	NNK	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Nantahala [3]	WGIE	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Nantasket [3]	WLIO	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Nantucket [5]	KQN	150	Merchants & Miners Trans. Co.	300, 450, 600	P G	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Napa [9]	NEVC	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Narbo	KDIG	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Narcissus	KDIH	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Narragansett NAMN [9]	NAMN	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Nashotah [3]	WBOU	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Natchez	KDJY	—	Charles Ward Engineering Works	—	—	—	—	—	
National Bridge [7] ..	KIBG	—	U.S. Shipping Board	300, **600**	P G ..	X	—	—	
Natirar	KDKM	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Natoma [9]	NUGG	—	—	300, **600**	P G ..	N	—	—	
Naugus [6]	KUPS	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Navahoe KOR [5] ..	KOR	200	Smith Nav. Corporation ..	300, 450, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Navaio [9]	NKZ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Navesink [6]	WXU	100	Government	300, **600**, 800	O ..	X	—	—	
Nawitka [6]	KELZ	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Neabsco [6]	KEKV	200	U.S. Shipping Board	300, 450, **600**	P G ..	X	0.20	—	
Nebraska NMA [9] ..	NMA	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Neches [9]	NIFP	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Nedmac [9]	KIQM	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Neeolah [7]	WLOA	—	U.S. Shipping Board	300, **600**	P G ..	—	0.20	—	
Nelson [5]	KNL	200	Cuba Distilling Co.	300, 450, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Nemaha	KUSR	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Neponset [3]	WQIO	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Neptune KUN [6] ..	KUN	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Neptune NMS [9] ..	NMS	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Nereus [9]	NNF	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Nero [9]	NEDX	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Nesco [7]	KEBT	300	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Neshaminy [3]	KILN	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Neshobee	KUNK	—	U.S. Shipping Board	—	P G ..	X	0.20	—	

[illegible]	[illegible]		Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
New Britain[6]	KIRG	—	U.S. Shipping Board	300, 600	P G	N	0.20	—
Newburgh[7]	WZUE	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
New England[6]	KUCB	—	U.S. Shipping Board	—	P G	X	0.20	—
New Hampshire KXF[4]	KXF	50	New England S.S. Co.	300, 550, 600	P G	N	0.15	—
New Hampshire NME[9]	NME	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
New Haven KXN[4]	KXN	50	New England S.S. Co.	300, 550, 600	P G	N	0.15	—
New Jersey[9]	NMF	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
New Orleans KDFB[8]	KDFB	—	U.S. Shipping Board	—	P G	X	0.20	—
New Orleans NMG[9]	NMG	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Newport NMH[9]	NMH	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Newport WWH[1]	WWH	150	Pacific Mail S.S. Co.	300, 600	P G	X	0.20[11] 0.40[12]	—
Newport News[9]	NHZ	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Newton KIRC[6]	KIRC	—	U.S. Shipping Board	300, 450, 600	P G	—	0.20	—
Newton KZX[5]	KZX	300	New England Fuel & Transportation Co.	300, 600	P G	X	0.20[11] 0.40[12]	—
New Windsor[5]	KGAE	—	U.S. Shipping Board	300, 600	P G	N	0.20	—
New York KSN[5]	KSN	200	Internat. Mer. Marine Co.	300, 600	P G	N	0.20[11] 0.40[12]	—
New York KUW[8]	KUW	300	Texas Company	300, 450, 600	P G	X	0.20[11] 0.40[12]	—
New York NCC[9]	NCC	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Niagara NABC[9]	NABC	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Nicholas[9]	NUNZ	—	—	300, 600	P G	N	—	—
Nicholson[9]	NIU	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Nika[3]	KOPM	—	Hodge S.S. Co.	—	P G	X	0.20	—
Nile KOSD[3]	KOSD	—	U.S. Shipping Board	—	P G	X	0.20	—
Niobe KDGB	KDGB	—	U.S. Shipping Board	—	P G	X	0.20	—
Nipmuc[5]	KOQX	—	U.S. Shipping Board	—	P G	X	0.20	—
Nipsic[7]	KCOE	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Nishmaha[8]	KEVM	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Nitro[8]	NELL	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Noa[9]	NUKF	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Nobles[6]	KODB	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Noccalula[8]	KORF	—	U.S. Shipping Board	—	P G	X	0.20	—
Nockum[7]	KOGJ	—	U.S. Shipping Board	—	P G	X	0.20	—
Noddle Island	KUKK	—	U.S. Shipping Board	—	P G	X	0.20	—
Nokatay[5]	KOCF	—	U.S. Shipping Board	300, 600	P G	N	0.20	—
Noma[6 16]	KYO	—	Vincent Astor	300, 600	P G	N	0.20[11] 0.40[12]	—
Nonantum[7]	KIXP	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Nora	KDGZ	—	W. R. Grace & Co.	—	P G	X	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Norfolk[6]	WZUA	—	Coastwise Transportation Co. ..	300, **600**	P G ..	X	0.20[11] 0.40[12]	—	
Norlina[5]	KJE	150	Garland S.S. Corpn.	300, **600**	P G ..	X	0.20[11] 0.40[12]	—	
Norma[7]	KEKC	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Norma Bridge[5] ..	WIG	200	Pan.-American Petroleum & Transport Co.	300, **600**	P G ..	X	0.20[11] 0.40[12]	—	
Norte (El)[5]	KKN	200	Southern Pacific Co.	300, 450, **600**	P G ..	X	0.20[11] 0.40[12]	—	
North American[5] ..	WEN	150	Chicago Duluth & Georgian Bay S.S. Co.	300, **600**	P G ..	N	0.10	—	
Northbend[6]	WPB	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
North Dakota[9] ..	NMO	—	Navy	300, **600**	P G ..	N	0.20[11] 0.40[12]	—	
Northern Pacific[6] ..	WIM	150	Army Transport	300, 450, **600**	P G ..	N	—	—	
Northern Star[7] ..	KOKC	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
North Land KJD[6] ..	KJD	200	Eastern S.S. Lines	300, **600**	P G ..	N	0.20[11]	—	
Northland WGJ[7] ..	WGJ	100	Albers Bros. Milling Co. ..	300, 450, **600**	P G ..	X	0.20[11] 0.40[12]	—	
North Pines[6]	WZEU	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
North Pole[7]	KELB	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Northwestern WAN[7] ..	WAN	100	Alaska S.S. Co.	300, **600**	P G ..	N	0.20[11]	—	
Northwestern Bridge[5]	KONK	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
North Wind[6, 10] ..	KYB	75	Chas. Martin Clark	300	P ..	X	—	—	
Norumbega[5]	KOZX	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Norwood[7]	WSG	250	Pacific Amer. Fisheries	300, 450, 525, **600**	P G ..	X	0.20[11]	—	
Nuecos[5]	KEH	200	Mallory S.S. Co.	300, **600**	P G ..	X	0.20[11] 0.40[12]	—	
Nupolela[7]	WLOE	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Nushagak[6]	WNE	300	Alaska-Portland Packer's Assn. ..	300, 400, 500, **600**	P G ..	N	0.20[11]	—	
Nyanza WJO[7] ..	WJO	100	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
O.1[9]	NEXJ	—	Navy	300, **600**	P G ..	N	0.20[11] 0.40[12]	—	
O.2[9]	NETJ	—	Navy	300, **600**	P G ..	N	0.20[11] 0.40[12]	—	

O.3 [9]	NAMR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.4 [9]	NAMX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.5 [9]	NAMZ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.6 [9]	NANB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.7 [9]	NAMC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.8 [9]	NAND	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.9 [9]	NAGB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.10 [9]	NAXT	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.11 [9]	NETK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.12 [9]	NETL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.13 [9]	NEZN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.14 [9]	NEVD	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.15 [9]	NAXS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O.16 [9]	NASM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O. A. Hermanson [8] ..	WRA	—	Southern Oil & Transport Corpn.	—	—	—	—	—
Oakland [3]	KMOO	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Obak [7]	KELV	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
O'Bannon [9]	NEXS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
O'Brien NIV [9] ..	NIV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Occidental	KUSJ	—	Texas S.S. Co.	—	P G ..	X	0.20	—
Occidente (El) [8] ..	KKX	200	Southern Pacific Co.	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Ocones [3]	KJC	200	U.S. Shipping Board	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Octorara WCD [8] ..	WCD	100	Great Lakes Transit Corpn. ..	300, 600	P G ..	N	0.10	—
Oeceola [9]	NOA	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Oglathorpe [7]	WZUU	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Ogontz [3]	KINB	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Ohio [9]	NMW	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Ohioan [3]	WKQ	200	Amer.-Hawaiian Corporation ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Ohonkara	KURV	—	Carll Tucker	—	—	—	—	—
Okiya [3]	WRUI	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Oklahoma [9]	NCB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Oklahoma City ..	KUML	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Oldham	KDQG	—	U.S. Shipping Board	—	P G ..	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs	
UNITED STATES OF AMERICA—*contd.*									
Old North State	KDHF	—	U.S. Shipping Board	—	P G	N	0.20	—	
Olen [5]	KINR	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Oleum [1]	WTD	150	Union Oil Co. of California	300, **600**, 1,800	P G	X	0.20 [11] 0.40 [12]	—	
Olympia NGG [9]	NGG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Omaha [9]	NISL	—	—	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Oneco [5]	KZUI	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Onekama [7]	KEDK	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Oneida KDJO	KDJO	—	Independent S.S. Co.	—	P G	X	—	—	
Oneida KYP [6 10]	KYP	250	E. C. Benedict	300, **600**	P G	X	—	—	
Oneonta [7]	WPX	100	Port of Portland	300, 450, **600**	P G	X	0.20 [11]	—	
Onondaga KDJR	KDJR	—	Independent S.S. Co.	—	P G	X	—	—	
Onondaga NRO [6]	NRO	200	U.S. Coastguard Dept.	300, **600**, 750, 1,000	P G	N	0.20	—	
Ontario [5]	KQO	150	Merchants & Miners Trans. Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Opelika [5]	KECL	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Opequan [3]	KIBK	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Ophis [5]	KODZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Orani [5]	KOBD	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Oraton [3]	KEMR	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Orchid [6]	NLT	250	U.S. Bureau of Lighthouses	**600**, 750, 1,000	P G	X	—	—	
Orcus [5]	KISC	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Oregon NMZ [9]	NMZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Oregon WGD [5]	WGD	150	Alaska Pacific Nav. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Oregon WOU [5]	WOU	—	Crowley Launch & Ingboat Co.	—	—	—	0.20 [11] 0.40 [12]	—	
Oregonian [3]	WKO	200	Amer.-Hawaiian S.S. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Oriente (El) [5]	KKV	200	Southern Pacific Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Orient [6]	KOLC	—	U.S. Shipping Board	—	P G	X	0.20	—	
Orinoco [5]	KIMX	300	Orinoco S.S. Corporation	300, **600**	P G	X	0.20	—	
Oriole [9]	NEVM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	

Orizaba [6]	KMEI	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Orleans KIDZ [5]	KIDZ	300	Orleans S.S. Corporation	300, 600	P G	N	0.20	—
Oronoke	KUNL	—	U.S. Shipping Board	—	P G	X	0.20	—
Ortolan [3]	NIKC	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Osage [6]	WJU	300	U.S. Shipping Board	300, 450, 600	P G	X	0.20	—
Osakis [5]	WEOI	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Osaqumsick [7]	KEVN	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Osawatomie [7]	KEVB	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Osborne NESN [9]	NESN	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Osborne NUQC [9]	NUQC	—	—	300, 600	P G	N	—	—
Oscar D. Bennett [5]	WIV	—	Pan-American Petroleum & Transport Co. (Inc.)	—	P G	X	0.20	—
Oscoda [3]	KEKT	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Oshkosh [7]	WFUU	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Oskaloosa [3]	WJII	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Oskawa [3]	WGUA	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Osprey KUJN	KUJN	—	East Coast Fisheries Co.	—	P G	X	—	—
Osprey NIJL [9]	NIJL	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Ossa [6]	KUFZ	—	U.S. Shipping Board	—	P G	X	0.20	—
Ossineke [7]	WTW	300	U.S. Shipping Board	300, 378, 600	P G	N	0.20	—
Ossining [5]	KEFR	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Ossipee [6]	NRJ	175	U.S. Coastguard Dept.	300, 600, 750, 1,000	P G	N	0.20	—
Oswego [5]	KRK	200	Union Petroleum S.S. Co.	300, 600	P G	X	0.20	—
Otho [5]	KULK	—	U.S. Shipping Board	—	P G	X	0.20	—
Otsego [5]	WDG	200	U.S. Shipping Board	300, 450, 600	P G	N	0.20	—
Otto M. Reiss [5]	WNG	200	Reiss S.S. Company	300, 450, 600	P G	X	0.10	—
O. T. Waring [5]	KJW	300	Standard Oil Co. of N.J.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Ourcq	KDMF	—	U.S. Shipping Board	—	P G	N	0.20	—
Outagamie	KULS	—	U.S. Shipping Board	—	P G	X	0.20	—
Overbrook [5]	KLAE	—	U.S. Shipping Board	300, 600	P G	N	0.20	—
Overton [9]	NUJN	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Oveson [9]	NIZD	—	—	300, 600	P G	N	—	—
Owatama [6]	WMOO	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Owego [5]	KFQ	300	Federal S.S. Corpn.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Owl [9]	NACS	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Oyaka [3]	KELX	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Ozama [6]	WRX	—	Atlantic Gulf & W. Indies S.S. Lines	300, 600	—	—	—	—
Ozark [9]	NHH	—	—	300, 600	P G	N	—	—
Ozaukee [7]	WXAA	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Ozette [3]	KEVP	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Ozmo [5]	KUJL	—	Northern Commercial Co.	—	P G	—	0.20	—
Padnsay [7]	KUQG	—	U.S. Shipping Board	—	P G	X	0.20	—
Paducah [9]	NOG	—	—	300, 600	P G	N	—	—
Pagasset	KDHG	—	U.S. Shipping Board	—	P G	N	0.20	—
Palisades [5]	KOLV	—	U.S. Shipping Board	—	P G	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Pallas	KUTJ	—	U.S. Shipping Board	—	P G	N	0.20	—	
Palmer [9]	NECV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Palo Alto	KDCT	—	U.S. Shipping Board	—	P G	X	0.20	—	
Palos [9]	NQS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Pamlico [6]	NRR	—	U.S. Coastguard Dept.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Pampanga [9]	NQT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Panama KMH [8]	KMH	—	Panama R.R. Co.	300, 450, **600**	P G	N	0.20 [11]	—	
Panaman [8]	WKR	200	Amer.-Hawaiian S.S. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Pan-American [8]	KUT	150	Texas S.S. Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Panay [6]	KEMJ	300	Madrigal & Co.	300, 450, 525, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Panga [7]	WJEU	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Panoil [3]	KUQC	—	Pan-American Petroleum & Transport Co.	—	P G	—	0.20	—	
Panola [3]	WMUO	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Panther [9]	NOJ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Panuco KMM [8]	KMM	200	Freeport & Tampico Fuel Oil Trans. Corpn.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Panuco KWM [8]	KWM	250	Atlantic Gulf & W. Indies S.S. Lines	300, 450, **600**	P G	X	0.40	—	
Paraguay KTT [8]	KTT	150	Sun Company	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Paraiso	WRI	—	Oliver J. Oliver	—	P G	X	0.20	—	
Parismina [6]	KDG	500	United Fruit Co.	300, **600**	P G	N	0.40	—	
Parker [9]	NIX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Parksville [8]	KIZG	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Parrott [9]	NUPD	—	—	300, **600**	P G	N	—	—	
Parthian [8]	WCE	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Patrick Henry [8]	KUPM	—	U.S. Shipping Board	—	P G	X	0.20	—	
Partridge [9]	NIJG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	

Pasadena [illegible]	[illegible]	500	[illegible]	[illegible]				
Pascagoula [8]	WBIU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Passaic Bridge [7] ..	KIBJ	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Pastores [8]	KLA	500	United Fruit Co.	300, 600	P G ..	N	0.40	—
Patapsco [9]	NOL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Patoka [9]	NUGN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Patrol KIN [8]	KIN	—	Police Dept.	300, 400, 600	P ..	N	—	—
Patterson NOK [9] ..	NOK	—	Navy	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Patuxent [9]	NOM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Paulding [9]	NON	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Paul Hamilton [9] ..	NAQN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Paul H. Harwood [8] ..	KJIO	—	Pan.Amer. Petroleum & Trans. Co.	300, 600	—	—	—	—
Paulsboro [5]	KRS	300	Vacuum Oil Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Pawlet [5]	KUBL	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Pawnee KDGC ..	KDGC	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Pawnee WLU [5] ..	WLU	250	U.S. Shipping Board	300, 450, 600	P G ..	N	0.20	—
Pawtucket [7]	KINZ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Peacock KDKY ..	KDKY	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Peacock NIKD [9] ..	NIKD	—	Navy	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Pearldon	KDLC	—	United States-Mexican Oil Corporation	—	P G ..	X	—	—
Pearl Shell [5]	WIC	250	Pearl Shell S.S. Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Peary [9]	NUQD	—	—	300, 600	P G ..	N	—	—
Pecos [9]	NIFQ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Peekskill [5]	KOMX	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Peerless NECP [9] ..	NECP	—	Navy	300 600	P G ..	N	0.20 [11] 0.40 [12]	—
Penguin KOMJ [8] ..	KOMJ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Penguin NECT [9] ..	NECT	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Pennant [5]	KME	200	Pierce Oil Corporation	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Pennsylvania KUP [8] ..	KUP	300	Texas S.S. Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Pennsylvania NCE [9] ..	NCE	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Pennsylvanian [8] ..	WKP	200	Amer.-Hawaiian S.S. Co. ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Penobscot [9]	NOE	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Pensacola NGN [9] ..	NGN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Penthis	KUPC	—	Sugar Products Co.	—	P G ..	—	—	—
Peoria [9]	NOW	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Pequonnock [4]	KXP	50	New England S.S. Co.	300, 550, **600**	P G	N	0.15	—	
Pequot NUPJ	NUPJ	—	—	300, **600**	P G	N	—	—	
Pequot WLX [7]	WLX	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Peralta	KDMJ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Percival [9]	NIFJ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Pere Marquette [5]	WDA	100	Pere Marquette Rld. Co.	300, 550, **600**	P R	X	0.10	—	
Pere Marquette 8 [5]	KINL	150	Pere Marquette Rld. Co.	300, **600**	P R	X	0.10	—	
Pere Marquette 17 [5]	WDC	100	Pere Marquette Rld. Co.	300, 500, **600**	P R	X	0.10	—	
Pere Marquette 18 [5]	WDD	100	Pere Marquette Rld. Co.	300, 450, **600**	P R	X	0.10	—	
Pere Marquette 19 [5]	WDB	100	Pere Marquette Rld. Co.	300, 500, **600**	P R	X	0.10	—	
Pere Marquette 20 [5]	WDE	100	Pere Marquette Rld. Co.	300, 500, **600**	P R	X	0.10	—	
Perfection [5]	KTN	200	Standard Transportation Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Perkins [9]	NOX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Persian [5]	KQX	200	Merchants & Miners Transportation Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Peter H. Crowell [6]	KEXT	200	Crowell & Thurlow S.S Co.	300, 476, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Peter Reiss [5]	WNX	100	Puget Sound Tug Boat Co.	300, **600**	P G	X	0.10	—	
Petoskey [5]	WDH	100	Chicago & S. Haven S.S. Co.	300, **600**	P G	X	0.10	—	
Philadelphia KDA [5]	KDA	300	Atlantic & Caribbean S.N. Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Philadelphia KSM [5]	KSM	200	Internat. Mercantile Marine Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Philip [9]	NEDG	—	Navy	300, **600**	P G	—	0.20	—	
Philippines [6]	WAV	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Philip Publicker	KDEW	—	—	—	—	—	—	—	
Phoenix WJEO [5]	WJEO	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Phoenix Bridge [6]	WFOU	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Phyllis [6]	KEA	—	W. R. Chamberlain & Co.	—	—	—	—	—	
Pigeon NIKF [9]	NIKF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Pinellas	KULB	—	U.S. Shipping Board	—	P G	X	0.20	—	
Pinola [9]	NEVL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Pioneer KIG [5]	KIG	200	Standard Oil Co. of N.J.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	

Pioneer WPN[6] ..	WPN	100	Puget Sound Tug Boat Co. ..	300, 600	P G ..	X	0.20	—	
Pipestone County[3] ..	KIMZ	—	U.S. Shipping Board ..	300, 600	P G ..	X	0.20	—	
Piscataqua[6]	NAQC	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—	
Pisco[3]	KEQV	—	Navy	300, 600	P G ..	—	0.20	—	
Pittsburgh[6]	NOT	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—	
Pittsburgh Bridge ..	KUKL	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
P. J. Reilly	KDMY	—	National Oil and Transport Co. ..	—	P G ..	X	—	—	
Plainfield[3]	WJEI	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Pleiades[7]	WNP	200	Luckenbach Co.	300, 600	P G ..	X	0.20[11] 0.40[12]	—	
Plover[6]	KUFT	—	East Coast Fisheries Co. ..	—	P G ..	X	—	—	
Plow City[6]	KUCC	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Plymouth KND[6] ..	KND	300	Nafra Company	300, 450, 600	P G ..	N	0.20[11] 0.40[12]	—	
Plymouth KXH[4] ..	KXH	50	New England S.S. Co.	300, 550, 600	P G ..	N	0.15	—	
Pocahontas[6]	KDOX	—	United States Mail S.S. Co. ..	—	P G ..	—	0.20	—	
Poe[6]	WYBL	—	—	300, 600	P G ..	N	—	—	
Point Adams[6] ..	WES	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Point Arena[3]	WHP	250	U.S. Shipping Board	300, 476, 600	P G ..	X	0.20	—	
Point Bonita[6] ..	WMT	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Point Judith[6] ..	KPAA	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Point Lobos[6]	KJUI	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Point Loma[7]	WAU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Polar Bear[3]	WGOE	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Polarine[6]	KOI	300	Standard Oil Co. of N.J. ..	300, 450, 600	P G ..	X	0.20[11] 0.40[12]	—	
Polar Sea[5]	KSOA	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Polar Star[6]	KELC	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Polybius[3]	KIGL	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Pompey[6]	NQF	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—	
Ponce[6]	KGP	300	N.Y. & Porto Rico S.S. Co. ..	300, 450, 600	P G ..	X	0.20[11] 0.40[12]	—	
Pontchartrain[6] ..	KIMP	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Pontia[3]	KIPC	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Pope[6]	NUQB	—	—	300, 600	P G ..	N	—	—	
Porter[6]	NOO	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—	
Portola Plumas[3] ..	KUMN	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Porto Rico[5]	WJG	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Portsmouth KOJV[7] ..	KOJV	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Potomac NQK[6] ..	NQK	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—	
Potter	KDFC	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Poughkeepsie[3] ..	KEZZ	—	U.S. Shipping Board	300, 600	P G ..	—	—	—	
Poznam[3]	WLY	100	Polish American Nav. Co. ..	300, 600	P G ..	N	0.20	—	
Prairie[6]	NQM	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—	
President[6]	WGP	150	U.S. Shipping Board	300, 600	P G ..	N	0.20[11] 0.40[12]	—	
[illegible]ston NUNJ[6] ..	NUNJ	—	—	300, 600	P G ..	N	—	—	
[illegible][6]	NUNG	—	—	300, 600	P G ..	N	—	—	

Ship Stations—*Continuea*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA -*contd.*							Francs.	Francs.	
Princess Matoika[6]	WLS	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Princeton[6]	KST	200	Standard Oil Co. of N.J.	300, 450, **600**	P G	X	0.20[11] 0.40[12]	—	
Priscilla[4]	KXI	50	New England S.S. Co.	300, 550, **600**	P G	N	0.15	—	
Proctor[9]	KEPQ	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Prometheus NQR[9]	NQR	—	Navy	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Proteus[9]	NNG	—	Navy	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Providence[4]	KXI	50	New England S.S. Co.	300, 550, **600**	P G	N	0.15[11]	—	
Provincetown	KDFE	—	U.S. Shipping Board	—	P G	N	0.20	—	
Pruitt[9]	NUPV	—	—	300, **600**	P G	N	—	—	
Prusa[3]	KELQ	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Pueblo[9]	NDN	—	Navy	300, **600**	P G	N	0.20[11] 0.10[12]	—	
Puget Sound[7]	WER	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Pulaski	KUQL	—	U.S. Shipping Board	—	P G	X	0.20	—	
Puritan WDU[8]	WDU	100	Graham & Morton Trans. Co.	300, **600**	P G	X	0.10	—	
Putnam KIXQ[8]	KIXQ	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Putnam NUPG[9]	NUPG	—	—	300, **600**	P G	N	—	—	
Pylos	KULQ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Pyramus[6]	KIPL	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Pyro[9]	NELK	—	Navy	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Python[5]	WNIO	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Quabbin[6]	KUJZ	—	U.S. Shipping Board	—	P G	X	0.20	—	
Quail[9]	NIKQ	—	Navy	300, **600**	P G	N	0.20[11] 0.40[12]	—	
Quaker City[7]	KOZL	—	U.S. Shipping Board	—	P G	X	0.20	—	
Quantico[4]	KQQ	—	Merchants & Miners Transportation Co.	300, 450, **600**	P G	N	0.20[11] 0.40[12]	—	
Queen[4]	WGX	—	Pacific Mail S.S. Co.	300, 450, **600**	P G	N	0.20[11] 0.40[12]	—	
Queen II[6]	WOY	40	Central Illinois Pub. Ser. Co.	400	P	X	—	—	
Quemakoning[7]	KETD	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Quidnic[7]	KSLO	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Quigley[9]	NIDB	—	—	300, **600**	P G	N	—	—	
Quinault KDND	KDND	—	W. H. Wood		P G	X	—	—	
Quinault KNFI[?]	KNFI	100	U.S. Shipping Board	300, **600**	P G	X	[illegible]	—	

Quinnipiac [7]	KOQT	—	U.S. Shipping Board	—	P G	X	0.20	—
Quiros [8]	NQZ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Quistconck [8]	WREI	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Quittacas [7]	WRUO	—	U.S. Shipping Board	—	P G	X	0.20	—
R.1 [9]	NILC	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.2 [9]	NILD	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.3 [9]	NILF	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.4 [9]	NILG	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.5 [9]	NILJ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.6 [9]	NILK	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.7 [9]	NILL	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.8 [9]	NILM	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.9 [9]	NILN	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.10 [9]	NILP	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.11 [9]	NILQ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.12 [9]	NILR	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.13 [9]	NILS	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.14 [9]	NILT	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.15 [9]	NASV	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.16 [9]	NASX	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.17 [9]	NAFX	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.18 [9]	NEGC	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.19 [9]	NEGK	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.20 [9]	NARZ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.21 [9]	NILV	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.22 [9]	NILX	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.23 [9]	NILZ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R.24 [9]	NIMB	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs	
UNITED STATES OF AMERICA—*contd.*									
R.25 [9]	NIMC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
R.26 [9]	NIMD	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
R.27 [9]	NIMF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Radford [9]	NEXB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Radiant KTR [8]	KTR	200	Standard Transportation Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Radnor [8]	KJUE	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Rail [9]	NAQJ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Rainbow NFZ [9]	NFZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Rainier [7]	WRZ	—	Albers Bros., Milling Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Rajah WAO [8]	WAO	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Raleigh NTE [9]	NTE	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Rama [8]	KRX	350	Rama Navigation Co.	300, 450, **600**	P G	X	0.40	—	
Ramapo [9]	NUGP	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Ramsay NIFC [9]	NIFC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Ranson B. Fuller [8]	KRF	200	Eastern S.S. Lines	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Rapidan KOSG [8]	KOSG	—	U.S. Shipping Board	—	P G	X	0.20	—	
Rapidan NUGQ [9]	NUGQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Rappahannock [8]	WQQ	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Rathburne [9]	NACR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Raven NIKZ [9]	NIKZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Rayo [8]	KTL	250	Standard Transportation Co.	300, **600**	P G	X	0.20	—	
Reaper	KDLG	—	Texas S.S. Co.	—	P G	X	—	—	
Red Cloud [8]	WJER	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Red Hook	KDDA	—	U.S. Shipping Board	—	P G	X	0.20	—	

Redondo KYT [6]	KYT	150	U.S. Shipping Board	300, 476, 600	P G	N	0.20	—
Redondo WBM [7]	WBM	100	Alaska S.S. Co.	300, 600	P G	X	0.20 [11]	—
Redwing [8]	NIKG	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Redwood [7]	WSD	250	Pacific-Amer. Fisheries	300, 450, 525, 600	P G	N	0.20 [11]	—
Reid [8]	NUNK	—	—	300, 600	P G	N	—	—
Relay [6]	KVZ	200	Mexican Telegraph Co.	300, 600	P	X	—	—
Relief [7]	KRJ	200	Merritt & Chapman Derrick & Wrecking Co.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Remlik [6]	KZR	200	Willis S. Kilmer	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Remus [5]	KEBX	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
Reno NAMD [8]	NAMD	—	Navy	300, 600	P G	N	0.20	—
Reno WYN [6]	WYN	30	Government	400	O	X	—	—
Renshaw [8]	NEVZ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Republic [5]	WSU	250	Chili S.S. Co.	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Rescue [7]	KRP	350	Merritt & Chapman Derrick & Wrecking Co.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Resolute [6]	KRM	200	Merritt & Chapman Derrick & Wrecking Co.	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Restorer WIU [5]	WIU	300	Commercial Pacific Cable Co.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
Reuben James [8]	NUNT	—	—	300, 600	P G	N	—	—
Reuce [6]	WSR	100	Columbia River Packers' Assn.	300, 525, 600	P G	X	0.20 [11]	—
Rhode Island NTX [8]	NTX	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Richard J. Reiss [5]	WNK	200	Reiss S.S. Co.	300, 600	P G	X	0.10	—
Richard Peck [4]	KXR	50	New England S.S. Co.	300, 450, 500, 550, 600	—	—	—	—
Richards [8]	NIDG	—	—	300, 600	P G	N	—	—
Richconcal	KUTX	—	U.S. Shipping Board	—	P G	X	0.20	—
Richmond KDOQ	KDOQ	—	Aiken Towboat Co.	—	P G	X	—	—
Richmond NISQ [8]	NISQ	—	—	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Richmond WTR [5]	WTR	200	Standard Oil Co. of California	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Ringgold [8]	NALT	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Rio (El) [5]	KKZ	200	Southern Pacific Co.	300, 450, 600	P G	N	0.20 [11] 0.40 [12]	—
Rio Grande KEG [5]	KEG	200	Mallory S.S. Co.	300, 600	P G	X	0.20 [11] 0.40 [12]	—
Ripon	KUGM	—	U.S. Shipping Board	—	P G	X	0.20	—
Riverside Bridge [6]	KUCD	—	U.S. Shipping Board	—	P G	X	0.20	—
Rizal [8]	NEVV	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
R. J. Hanna [5]	KDRD	300	Standard Oil Co. of California, Inc.	300, 600	P G	X	0.40	4.00
Roanoke KOXY [6]	KOXY	—	Texas Company	—	P G	X	—	—
Roanoke NHU [8]	NHU	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radiotelegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Robert C. Sudden	KDQR	—	Thomas Crowley	—	P G	X	—	—	
Robert M. Thompson [6]	KNW	—	J. W. Elwell & Co.	—	—	—	—	—	
Robert P. Clark [6]	KTH	150	Gulf Refining Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Robert Smith [6]	NUKB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Robin [6]	NANQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Robin Adair [7]	KOVM	—	Robin Line S.S. Co.	—	P G		0.20	—	
Robin Goodfellow [7]	KUBN	—	U.S. Shipping Board	—	P G	X	0.20	—	
Robin Gray [7]	KOXT	—	Robin Line S.S. Co.	—	P G	X	0.20	—	
Robin Hood [6]	KOTM	—	U.S. Shipping Board	—	P G	X	0.20	—	
Robinson [6]	NAJX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Rochester KUTZ	KUTZ	—	Vacuum Oil Co.	—	P G	X	—	—	
Rochester NTR [6]	NTR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Rockaway Park [6]	KIZZ	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Rock Island Bridge [6]	KORN	—	U.S. Shipping Board	—	P G	X	0.20	—	
Rockport KOZD [7]	KOZD	—	U.S. Shipping Board	—	P G	X	0.20	—	
Rodgers [6]	NWT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Rodman Swift [6]	KDKQ	50	Submarine Signal Co.	200, 300, **600**	P R	X	—	—	
Roe [6]	NTZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Romagne [6]	KDJX	150	Independent S.S. Co.	300, **600**	P G	X	0.20	—	
Romulus [6]	KIDR	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Roosevelt [6]	NLR	300	Navy	300, **600**	O	X	—	—	
Roper [6]	NERX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Rose City [6]	WWR	200	S.F. & P.S.S. Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Rose Mahoney [6]	KSAE	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Rowan [6]	NKR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Royal Arrow [6]	KSW	300	Standard Transit Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Ruby [6]	[illegible]	—	Amer. Transportation Co.	300, **600**	—	—	[illegible]		

Ruth[3]	KZQ	200	A. H. Bull S.S. Co.	300, 600	P G ..	X	0.20[11] 0.40[12]	—
Ruth E. Merrill[6] ..	KQU	200	Olympia Shipping Corpn. ..	300, 600	P G ..	X	0.20[11] 0.40[12]	—
S.1[9]	NIMG	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.2[9]	NIMJ	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.3[9]	NIMK	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.4[9]	NIML	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.5[9]	NIMM	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.6[9]	NIMN	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.7[9]	NIMP	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.8[9]	NIMQ	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.9[9]	NIMR	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.10[9]	NIMS	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.11[9]	NIMT	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.12[9]	NIMV	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.13[9]	NIMX	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.14[9]	NIMZ	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.15[9]	NINB	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.16[9]	NINC	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.17[9]	NIND	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.18[9]	NINF	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.19[9]	NING	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.20[9]	NINJ	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.21[9]	NINK	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.22[9]	NINL	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.23[9]	NINM	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S.24[9]	NINN	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
S.25*	NINP	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.26*	NINQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.27*	NINR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.28*	NINS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.29*	NINT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.30*	NINV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.31*	NINX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.32*	NINZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.33*	NIPB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.34*	NIPC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.35*	NIPD	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.36*	NIPF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.37*	NIPG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.38*	NIPJ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.39*	NIPK	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.40*	NIPL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.41*	NIPM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.42*	NIPN	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.43*	NIPP	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	

S.46 [9]	NIPS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.47 [9]	NIPT	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.48 [9]	NIPV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.49 [9]	NIPX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.50 [9]	NIPZ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.51 [9]	NIQK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Sabine KEB [8]	KEB	300	Mallory S.S. Co.	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Sabine Sun [6]	WLQ	—	Sun Company	—	—	—	—	—	
Sabotawan [7]	KIJJ	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Sacandaga [8]	KESC	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Sacarappa [8]	WGOI	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Sac City [8]	KEFB	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—	
Saco [7]	KEPT	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Sacramento KWV [8] ..	KWV	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Sacramento NQV [9] ..	NQV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Sagadahoc [8]	KTUO	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Sagaporack [8]	KZIU	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Sag Harbour [7]	WPAE	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Sagua KVO [8]	KVO	300	Atlantic Fruit Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Saguache [8]	KEKL	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Sahale [8]	KEPR	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Salaam	KURP	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Salaverry [6]	KEQX	—	U.S. Shipping Board	—	—	—	—	—	
Salem [9]	NTP	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Salem County [8] ..	KODR	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—	
Salinas [9]	NUGR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Salmon KPOU [8] ..	KPOU	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Saluda [8]	KEGQ	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Salvation Lass [7] ..	KIMN	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Samoa [9]	NABR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Sampson [9]	NKS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Samuel L. Fuller ..	KDMS	—	Sinclair Navigation Co.	—	P G ..	X	—	—	
Samuel Mitchell [8] ..	WEJ	200	Huron Transportation Co. ..	300, 450, 600	P G ..	X	0.10	—	
Sanderling [9]	NIJS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Sandpiper [9]	NIKK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Sands [9]	NULQ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Sangamon [3]	WJAA	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Santanta [6, 10]	KZS	100	Osborn Howes	300, **600**	P G	X	—	—	
Santiago [3]	KWE	300	N.Y. & Cuba Mail S.S. Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Santore [5]	KDQ	200	Ore S.S. Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Sapelo [9]	NUCS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sapinero [5]	KESG	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Sapona [7]	KOSP	—	U.S. Shipping Board	—	P G	X	0.20	—	
Sarah Weems [6]	WQJ	—	Baltimore & Carolina S.S. Co.	—	—	—	—	—	
Saramaca [6]	KLH	350	United Fruit Co.	300, **600**	P G	N	0.40	—	
Sara Thompson [9]	NEMD	—	—	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Saratoga [9]	NTR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sarcoxie [8]	WLAA	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Saris [7]	WGIO	150	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Satartia [5]	KIDC	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Satsuma KJI [4]	KJI	200	Barber & Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Satterlee [9]	NAGC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Saturn [9]	NNM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Saucon [3]	WBK	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Saugerties [7]	WAB	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Saugus [3]	KIBQ	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Savannah [9]	NGS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Saxon WZEA [6]	WZEA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
S. B. Hunt [6]	KIPR	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Scally [9]	NEKC	—	—	300, **600**	P G	N	—	—	
Scantic [3]	KILR	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Schench [9]	NEMG	—	Navy	300, **600**	P G	N	0.20 [11] **0.40** [13]	—	
Schenectady [5]	WJIU	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Schley [9]	NKT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [14]		

Schuylkill	KUKC	—	U.S. Shipping Board	—	P G	X	0.20	—
Sciota [9]	NEVK	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—
Scorpion [9]	NTT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—
Scottsburg [7]	KOMM	—	U.S. Shipping Board	—	P G	X	0.20	—
S. C. T. Dodd	KDML	—	Standard Oil Co. of California, Incorp.	—	P G	X	0.20[11] 0.40[12]	—
Sea Bird [6]	KICT	—	Sea Bird Co.	—	—	—	—	—
Seafarer [6]	WPL	—	Seafarer Nav. & Salvage Co.	—	—	—	—	—
Seagull [9]	NIJM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—
Sea Lion	KDOJ	—	—	—	—	—	—	—
Sea Monarch [6]	KDQU	—	Ship Owners and Merchants Tugboat Co.	—	P G	X	0.20	—
Sea Rover [9]	NEX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—
Seattle NAPG [9]	NAPG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—
Seattle Spirit [7]	KISD	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—
Sebago [9]	NUV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—
Security [5]	KSJ	200	Standard Transportation Co.	300, **600**	P G	X	0.20 [11]	—
Seeandbee [5]	WFS	150	Cleveland & Buffalo Transit Co.	300, **600**	P G	X	0.10	—
Seekonk [5]	KIGF	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—
Segundo (El) [5]	WTQ	150	Standard Oil Co. of California	300, **600**	P G	X	0.20 [11] 0.40 [12]	—
Seguranca [5]	KWG	200	Federal S.S. Corpn.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—
Selfridge [9]	NUJZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—
Selma [3]	KUKQ	—	U.S. Shipping Board	—	P G	X	0.20	—
Selma City [5]	KDRJ	—	U.S. Steel Products Co.	—	P G	N	0.40	—
Seminole KUGP	KUGP	—	U.S. Shipping Board	—	P G	X	0.20	—
Seminole NRS [6]	NRS	200	U.S. Coastguard Dept.	300, **600**, 952	P G	N	0.20 [11] 0.40 [12]	—
Semmes [9]	NAFZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—
Senator WGS [5]	WGS	100	Pacific S.S. Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—
Senator Bailey [5]	KGS	200	Gulf Refining Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—
Seneca KDJW [6]	KDJW	150	Independent S.S. Co.	300, **600**	P G	X	0.20	—
Seneca NRE [6]	NRE	200	U.S. Coastguard Dept.	300, **600**, 750, 956	P G	N	0.20	—
Sepulga [9]	NUGT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—
Sequoia [6]	NLV	100	Bureau of Lighthouses	300, **600**, 750	O	X	—	—
Severance [7]	KXOE	—	Union Sulphur Co.	—	—	—	—	—
Sewalls Point [6]	KGX	200	U.S. Shipping Board	300, 450, **600**	P G	N	0.20	—
Sewickley [3]	KPII	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Shannock [8]	KOBB	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Sharkey [8]	NULV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sharon KIRK [8]	KIRK	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Shaume [8]	KILQ	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Shaw [8]	NKU	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Shawmut [8]	NML	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sheldrake [8]	KUFX	—	East Coast Fisheries Co.	—	P G	X	—	—	
Shenandoah [8]	KIBD	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Shenango [8]	KTC	200	Gulf Refining Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Sheridan WXJ [8]	WXJ	300	U.S. Army Transport	600	P G	N	—	—	
Sherman KMQ [8]	KMQ	250	Sherman S.S. Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Sherman WXK [8]	WXK	300	U.S. Army Transport	600	P G	N	—	—	
Shickshinny [8]	KIZP	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Shirk [8]	NUJV	—	Navy	300, **600**	P G.	N	0.20 [11] 0.40 [12]	—	
Shooters Island [8]	KERG	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Shortsville [8]	KIKK	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Siaha [8]	WFY	—	Henry Ford	—	P G	X	0.40	—	
Siboney [8]	WRN	—	N.Y. and Cuba Mail S.S. Co.	300, **600**	P G	N	0.20	—	
Sicard [8]	NUPL	—	—	300, **600**	P G	N	—	—	
Sierra KRW [8]	KRW	200	E. K. Wood Lumber Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Siglo (El) [8]	KKS	200	Southern Pacific Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sigourney [8]	NAJB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Siletz [8]	KODG	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Silverado [8]	WRC	150	U.S. Shipping Board	300, 476, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Silverbrook [8]	KIBC	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Silver Shell [8]	WIA	400	Silvershell S.S. Co.	300, 450, **600**	P G	X	0.20	—	
Silver State	KDPA		U.S. Shipping Board	[illegible]	P G	N	[illegible]	—	
[illegible]	NUPX			[illegible], **600**	P G	N			

[illegible]	[illegible]	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sinsinawa [6]	KOJD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Sioux City	KUGK	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Sioux Falls [6]	KONN	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Sir Thomas Shaughnessy [6]	WFV	200	Jenkins S.S. Co.	300, 450, 600	P G ..	X	0.10	—
Sixaola [6]	KDS	500	United Fruit Co.	300, 600	P G ..	N	0.40	—
Skagway [6]	WAT	100	Alaska S.S. Co.	300, 600	P G ..	X	0.20 [11]	—
Slocum [6]	WWY	—	Government	300, 600	—	—	—	—
S. M. Fischer [6] ..	WPH	200	Reid Towing & Wrecking Co. ..	300, 600	P G ..	X	0.10	—
Smith [6]	NIXG	—	—	300, 600	P G ..	N	—	—
Smith Thompson [6] ..	NUJJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
S. M. Spalding [6] ..	WKG	—	Pan.-Amer. Petroleum & Trans. Co.	—	—	—	—	—
Snipe [6]	KUFS	—	East Coast Fisheries Co. ..	—	P G ..	X	—	—
Snoohomish [6]	NRF	200	U.S. Coastguard Dept.	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
S.O. Co. No. 91 [5] ..	WTU	100	Standard Oil Co. of California ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
S.O. Co. No. 93 [5] ..	WTY	100	Standard Oil Co. of California ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
S.O. Co. No. 95 [5] ..	WTZ	100	Standard Oil Co. of California ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Socony [5] .. .	KTX	250	Standard Oil Co. of N.Y. ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Socony 82 [5]	KVAI	200	Standard Oil Co. of N.Y. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Socony 83 [5]	KVAO	200	Standard Oil Co. of N.Y. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Socony 84 [5]	WCOE	—	Standard Oil Co. of N.Y. ..	300, 600	P G ..	—	0.20 [11] 0.40 [12]	—
Socony 85 [5]	WKAE	200	Standard Oil Co. of N.Y. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Socony 88 [5]	KRUU	200	Standard Oil Co. of N.Y. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Socony 89 [5]	KSAA	275	Standard Oil Co. of N.Y. ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Socony 90 [5]	WTII	200	Standard Oil Co. of N.Y. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Socony 92 [5]	WCOI	—	Standard Oil Co. of N.Y. ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Socony 94 [5]	WTIO	200	Standard Oil Co. of N.Y. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Sol (El) [6]	KKB	200	Southern Pacific Co.	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Solace [6]	NST	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Solana	KDQJ	—	Pacific Mail S.S. Co.	—	P G ..	X	—	—
Solitaire [7]	KUMT	—	Texas S.S. Co.	—	P G ..	X	—	—
Somers [6]	NWV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Somerset KSU [6] ..	KSU	300	Standard Oil Co. of N.J.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Somme KDKZ ..	KDKZ	—	U.S. Shipping Board	—	P G ..	N	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Sonoma NTG [6]	NTG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sonoma WHM [1]	WHM	250	Oceanic S.S. Co.	300, **600**, 1,800	P G	N	0.40	—	
Sotoyomo [6]	NUX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
South American [6]	WEO	125	Chicago Duluth & Georgian Bay S.S. Co.	300, **600**	P G	N	0.10	—	
Southard [6]	NAJK	—	—	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
South Bend [6]	KEXQ	—	U.S. Army Transport	300, **600**	P G	N	—	—	
South Carolina [6]	NSW	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
South Pole [3]	WDIA	300	U.S. Shipping Board	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.P. 43 [6]	NUBB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.P. 54 [6]	NUBK	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.P. 179 [6]	NUDF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.P. 181 [6]	NEFS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.P. 185 [6]	NUFZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.P. 214 [6]	NUCX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.P. 249 [6]	NUCZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.P. 265 [6]	NUCT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.P. 340 [6]	NUBZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.P. 309 [6]	NUFG	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
S.P. 403 [6]	NDV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	

S.P. 70[illegible]	NUDR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.P. 726 [6]	NUBS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.P. 765 [6]	NUCK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.P. 838 [6]	NUFL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.P. 909 [6]	NUBC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.P. 1149 [6]	NUFN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.P. 1234 [6]	NUCJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.P. 2047 [6]	NAQM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.P. 2225 [6]	NECD	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.P. 2373 [6]	NUDK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.P. 3218 [6]	NUGB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S.P. 3297 [6]	NUBR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
S. P. Lee [6]	NESB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Spokane [5]	WGE	100	Pacific S.S. Co.	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—	
Sprigg Carroll [6] ..	WZU	30	Government	300, 600	P G ..	X	—	—	
Springfield	KUTR	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Sproston [6]	NEVT	—	Navy	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Standard KIC [5] ..	KIC	200	Standard Oil Co. of N.J. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Standard KXOI [5] ..	KXOI	—	Standard Transportation Co. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Standard II [5]	KSA	200	Standard Transportation Co. ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Standard Arrow [5] ..	KSV	250	Standard Transportation Co. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Standtow No. 1 [5] ..	KPO	200	Standard Oil Co. of N.J., Incorp.	300, 450, 600	P G ..	—	0.20	—	
Standtow No. 2 [5] ..	KPK	200	Standard Oil Co. of N.J., Incorp.	300, 450, 600	P G ..	X	0.20	—	
Standtug No. 1 [6] ..	KOQM	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Stanley KISJ [7] ..	KISJ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—	
Stanley Dollar [7] ..	WHS	150	Dollar S.S. Line	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Stansbury [6]	NEXV	—	Navy	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	
Stanwood [6]	KHD	—	W. R. Chamberlin & Co. ..	—	—	—	—	—	
Star I [6]	WRIO	150	U.S. Whaling Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Star of Greenland[6] ..	KERF	200	Alaska Packers' Association ..	300, 400, **600**	P G ..	X	0.20[11] 0.40[12]	—	
Star of Holland[5] ..	KUGQ	—	Alaska Packers' Association ..	—	P G ..	X	0.20	—	
Star of Lapland[6] ..	KXOA	200	Alaska Packers' Association ..	300, **600**	P G ..	X	0.20[11] 0.40[12]	—	
Starr[7]	WPS	100	San Juan Fishing and Packing Co.	300, **600**	P G ..	X	0.20	—	
Staten Island	KUMD	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
State of Ohio[5] ..	WFR	100	Cleveland and Buffalo Transit Co.	300, **600**	P G ..	X	0.10	—	
Steadfast WDEO[8] ..	WDEO	—	U.S. Shipping Board	300, **600**	P G ..	—	0.20	—	
Steel Age[6]	KOXZ	—	U.S. Steel Products Co.	—	P G ..	—	0.20[11] 0.40[12]	—	
Steel Engineer.. ..	KDCX	—	U.S. Steel Products Co.	—	P G ..	N	—	—	
Steel Exporter ..	KDDN	—	U.S. Steel Products Co.	—	P G ..	N	—	—	
Steel Inventor ..	KDJL	—	U.S. Steel Products Co.	—	P G ..	N	—	—	
Steelmaker[6]	KOXX	—	U.S. Steel Products Co.	—	P G ..	—	0.20[11] 0.40[12]	—	
Steel Ranger	KDGL	—	U.S. Steel Products Co., N.Y. ..	—	P G ..	N	—	—	
Steel Voyager	KUFN	—	U.S. Steel Products Co.	—	P G ..	N	—	—	
Stellenwerf[6]	NIDC	—	—	300, **600**	P G ..	N	—	—	
Stephen R. Jones[6] ..	KXX	—	Crowell and Thurlow S.S. Co. ..	—	—	—	—	—	
Sterrett[6]	NTB	—	Navy	300, **600**	P G ..	N	0.20[11] 0.40[12]	—	
Stevens[6]	NAPK	—	Navy	300, **600**	P G ..	N	0.20[11] 0.40[12]	—	
Stewart[6]	NUNN	—	—	300, **600**	P G ..	N	—	—	
Stockton KDDS ..	KDDS	—	U.S. Steel Products Co.	—	P G ..	X	0.20	—	
Stockton[6]	NEO	—	Navy	300, **600**	P G ..	N	0.20[11] 0.40[12]	—	
Stoddert[6]	NALZ	—	Navy	300, **600**	P G ..	N	0.20[11] 0.40[12]	—	
Stonewall	KDOV	—	Garland S.S. Corporation ..	—	P G ..	X	—	—	
Storm King[6]	KOGM	—	Rolph Nav. & Coal Co.	—	P G ..	X	0.20	—	
Storm King KDJM ..	KDJM	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Stribling[6]	NAVS	—	Navy	300, **600**	P G ..	N	0.20[11] 0.40[12]	—	
Stringham[6]	NACP	—	Navy	300, **600**	P G ..	N	0.20[11] 0.40[12]	—	
[illegible] Bay[1]	KJOI		U.S. Shipping Board	300, **600**	P G	N	0.20		

Sub-chaser 19 *	..	NOBL	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[12] 0.20[11] 0.40[12]	—	
Sub-chaser 21 *	..	NOBN	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 23 *	..	NOBQ	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 24 *	..	NOBR	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 25 *	..	NOBS	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 26 *	..	NOBT	—	Navy	..	..	..	..	300. 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 35 *	..	NOBZ	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 37 *	..	NOCC	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 40 *	..	NOCG	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 42 *	..	NOCK	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 43 *	..	NOCL	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 44 *	..	NOCM	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 45 *	..	NOCN	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 46 *	..	NOCP	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 47 *	..	NOCO	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 48 *	..	NOCR	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 49 *	..	NOCS	—	Navy	..	..	..	..	300 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 50 *	..	NOCT	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 51 *	..	NOCV	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 52 *	..	NOCX	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 53 *	..	NOCZ	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 54 *	..	NODB	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 55 *	..	NODC	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 56 *	..	NODD	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub-chaser 57 *	..	NODF	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	
Sub chaser 62 *	..	NODM	—	Navy	..	..	..	..	300, 600	P G	..	N	0.20[11] 0.40[12]	—	

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Sub-chaser 63 [9]	NODN	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 64 [9]	NODP	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 68 [9]	NODQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 69 [9]	NODR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 70 [9]	NODS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 71 [9]	NODT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 72 [9]	NODV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 73 [9]	NODX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 74 [9]	NODZ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 77 [9]	NOFB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 93 [9]	NOFX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 95 [9]	NOGB	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 96 [9]	NOGC	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 100 [9]	NOGJ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 102 [9]	NOGL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 104 [9]	NOGN	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 105 [9]	NOGP	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 106 [9]	NOGQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 109 [9]	NOGT	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	

Sub-chaser 116*	..	NOJF	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 117*	..	NOJG	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 118*	..	NOJJ	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 119*	..	NOJK	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 120*	..	NOJL	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 121*	..	NOJM	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 123*	..	NOJP	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 126*	..	NOJS	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 128*	..	NOJV	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 129*	..	NOJX	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 133*	..	NOKD	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 134*	..	NOKF	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 135*	..	NOKG	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 136*	..	NOKJ	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 138*	..	NOKL	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 143*	..	NOKN	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 144*	..	NOKP	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 145*	..	NOKQ	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 147*	..	NOKR	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 148*	..	NOKS	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 154*	..	NOLC	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 156*	..	NOLF	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 159*	..	NOLK	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 164*	..	NOLL	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 165*	..	NOLM	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11]	—
Sub-chaser 166*	..	NOLN	—	Navy	..	..	..	..	300, 600	P G	..	N	0.40[18] 0.20[11] 0.40[18]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge.		Remarks.
							Per Word.	Minimum per Radiotelegram.	
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Sub-chaser 167 [9] ..	NOLP	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 168 [9] ..	NOLQ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub chaser 177 [9] ..	NOLR	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 178 [9] ..	NOLS	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 180 [9] ..	NOLV	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 181 [9] ..	NOLX	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 182 [9] ..	NOLZ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 184 [9] ..	NOMC	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 185 [9] ..	NOMD	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 186 [9] ..	NOMF	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 187 [9] ..	NOMG	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 188 [9] ..	NOMJ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 190 [9] ..	NOML	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 191 [9] ..	NOMM	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 192 [9] ..	NOMN	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 193 [9] ..	NOMP	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 194 [9] ..	NOMQ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 195 [9] ..	NOMR	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 196 [9] ..	NOMS	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	

Sub-chaser 206 * ..	NONJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 208 * ..	NONL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 210 * ..	NONN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 211 * ..	NONP	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub chaser 212 * ..	NONQ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 213 * ..	NONR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 214 * ..	NONS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 215 * ..	NONT	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 216 * ..	NONV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 217 * ..	NONX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 218 * ..	NONZ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 220 * ..	NOPB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 221 * ..	NOPC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 223 * ..	NOPF	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 224 * ..	NOPG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 226 * ..	NOPK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 228 * ..	NOPM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 229 * ..	NOPN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 230 * ..	NOPP	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 231 * ..	NOPQ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	
Sub-chaser 232 * ..	NOPR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 235 * ..	NOPV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 236 * ..	NOPX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 237 * ..	NOPZ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 238 * ..	NOQB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 239 * ..	NOQC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 245 * ..	NOQK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 246 * ..	NOQL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Sub-chaser 248* ..	NOQN	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 250* ..	NOQP	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 251* ..	NOQQ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 253* ..	NOQS	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 254* ..	NOQT	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 255* ..	NOQV	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 257* ..	NOQZ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 258* ..	NORB	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 259* ..	NORC	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 262* ..	NORG	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 263* ..	NORJ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 264* ..	NORK	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 265* ..	NORL	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 266* ..	NORM	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 268* ..	NORP	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 269* ..	NORQ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 270* ..	NORR	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 271* ..	NORS	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 272* ..	NORT	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	

Sub-chaser 273*	NORV	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 276*	NOSB	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 277*	NOSC	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 278*	NOSD	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 282*	NOSK	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 283*	NOSL	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 284*	NOSM	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 287*	NOSQ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 288*	NOSR	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 291*	NOSV	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 294*	NOTB	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 295*	NOTC	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 296*	NOTD	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 298*	NOTG	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 299*	NOTJ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 301*	NOTL	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 303*	NOTN	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 304*	NOTP	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 305*	NOTQ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 306*	NOTR	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 307*	NOTS	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 308*	NOTT	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 309*	NOTV	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 310*	NOTX	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 320*	NOVC	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 322*	NOVF	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 326*	NOVL	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Sub-chaser 328*	NOVN	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Sub-chaser 329 [9] ..	NOVP	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 330 [9] ..	NOVQ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 331 [9] ..	NOVR	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 332 [9] ..	NOVS	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 336 [9] ..	NOVZ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 338 [9] ..	NOXC	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 339 [9] ..	NOXD	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 340 [9] ..	NOXF	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 341 [9] ..	NOXG	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 351 [9] ..	NOXQ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 352 [9] ..	NOXR	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 353 [9] ..	NOXS	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 354 [9] ..	NOXT	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 356 [9] ..	NOXX	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 408 [9] ..	NOZC	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 409 [9] ..	NOZD	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 412 [9] ..	NOZJ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 413 [9] ..	NOZK	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Sub-chaser 419 [9] ..	NOZR	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	

Sub-chaser 420 [9] ..	NOZS	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 421 [9] ..	NOZT	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 422 [9] ..	NOZV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 423 [9] ..	NOZX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 424 [9] ..	NOZZ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 425 [9] ..	NIQB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 426 [9] ..	NIQC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 427 [9] ..	NIQD	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 428 [9] ..	NIQF	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 429 [9] ..	NIQG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 430 [9] ..	NIQJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 432 [9] ..	NIQL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 439 [9] ..	NIQT	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 440 [9] ..	NIQV	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 441 [9] ..	NIQX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 443 [9] ..	NIRB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sub-chaser 444 [9] ..	NIRC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Suboatco	KURZ	—	Submarine Boat Corporation ..	—	P G ..	X	—	—
Sucrosa [6]	KNS	300	Cuba Distilling Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Sucubaco	KDQL	—	Submarine Boat Corporation ..	—	—	—	—	—
Sudawsonco	KDFJ	—	Submarine Boat Corporation ..	—	P G ..	X	—	—
Sud (El) [5]	KKQ	200	Southern Pacific Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Sudbury KRZ [5] ..	KRZ	150	Shawmut S.S. Co.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Suduffco	KDDO	—	Submarine Boat Corporation ..	—	P G ..	X	—	—
Sudurco	KDEY	—	Submarine Boat Corporation ..	—	P G ..	X	—	—
Suedco	KUSB	—	Submarine Boat Corporation ..	—	P G ..	X	—	—
Suffolk WRS [6] ..	WRS	—	Coastwise Transportation Co. ..	—	—	—	—	—
Sugillenco	KDLS	—	Submarine Boat Corporation ..	—	P G ..	X	—	—
Sujameco	KDLF	—	Submarine Boat Corporation ..	—	P G ..	X	—	—
Sujerseyco [12]	KDNH	—	Submarine Boat Corporation ..	—	P G ..	X	0.20	—
Sulanierco	KDFI	—	Submarine Boat Corporation ..	—	P G ..	X	—	—
Sumac [9]	NASG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Sumanco	KDDH	—	Submarine Boat Corporation ..	—	P G ..	X	—	—
Summerleaf [7]	KUGR	—	U.S. Shipping Board	—	P G ..	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Sumner [9]	NUQX	—	—	300, **600**	P G	N	—	—	
Sun [5]	KTU	250	Sun Company	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Sunbeam [6]	KODC	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Sundance [3]	KORD	—	U.S. Shipping Board	—	P G	X	0.20	—	
Sunelseco	KUSC	—	Submarine Boat Corporation	—	P G	X	—	—	
Sunewarkco [13]	KDNI	—	Submarine Boat Corporation	—	P G	X	0.20	—	
Sunflower [9]	NUFM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Sunlite [5]	KPQ	200	Standard Oil Co. of N.J.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Sunoil [5]	KWP	200	Sun Company	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Sunshine [6]	KOFG	—	Sun Company	—	P G	X	0.20	—	
Sunugentco	KDNX	—	Submarine Boat Corporation	—	P G	X	0.20	—	
Suphenco	KDRP	—	Submarine Boat Corporation	—	P G	X	—	—	
Supply [9]	NTK	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Suremico	KDHB	—	Submarine Boat Corporation	—	P G	X	—	—	
Suricho	KDHA	—	Submarine Boat Corporation	—	P G	X	—	—	
Surico	KDDP	—	Submarine Boat Corporation	—	P G	X	—	—	
Suriname [8]	KLI	350	United Fruit Co.	300, **600**	P G	N	0.40	—	
Suruga [5]	KGD	300	N.Y. & Oriental S.S. Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Surveyor [9]	NQU	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Susana [5]	KNX	200	Fiat Corporation	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Susanna II [6]	KEMG	—	Madrigal & Co.	—	—	—	—	—	
Suscolanco	KDFK	—	Submarine Boat Corporation	—	P G	X	—	—	
Susherico	KDDQ	—	Submarine Boat Corporation	—	P G	X	—	—	
Suspearco [13]	KDPC	—	Submarine Boat Corporation	—	P G	X	—	—	
Susquehanna KOLN [6]	KOLN	—	U.S. Shipping Board	—	P G	X	0.20	—	
Susquehanna WEM [6]	WEM	200	U.S. Shipping Board	300, 450, **600**	P G	X	0.20 [11]	—	
Sutermco	KDDI	—	Submarine Boat Corporation	—	P G	X	—	—	
Sutherland WTJ [7]	WTJ	200	U.S. Shipping Board	300, 476, **600**	P G	X	0.20 [11] 0.40 [12]	—	
[illegible]	KDLD	—	Submarine Boat Corporation	—	P G	X	—	—	
[illegible]	KOXC	—	U.S. Shipping Board	—	P G	X	0.20	—	

Swallow NEFL[9]	NEFL	—	Navy	300, 600	P G ..	N	0.40[12] 0.20[11]	—
Swampscott[7]	WQIU	—	U.S. Shipping Board	300, 600	P G ..	N	0.40[12] 0.20	—
Swan NIJP[9]	NIJP	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Swasey[9]	NIGP	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Swift Arrow	KDOS	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Swift Eagle	KDRK	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Swift Scout	KDQV	—	U.S. Shipping Board	—	P G ..	N	0.20	—
Swiftstar	KDPF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Swiftsure	KDNG	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Sylph NTL[9]	NTL	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Sylvan Arrow[5] ..	KSX	250	Standard Transportation Co. ..	300, 600	P G ..	X	0.20[11] 0.40[12]	—
Syros KDEC	KDEC	—	U.S. Shipping Board	—	P G ..	X	0.20	—
S. Alicia[5]	WSJ	150	Grace S.S. Co.	300, 450, 600	P G ..	X	0.20[11] 0.40[12]	—
S. Ana WAL[3] ..	WAL	100	Alaska S.S. Co.	300, 600	P G ..	X	0.20[11]	—
S. Ana WBX[5] ..	WBX	—	Grace S.S. Co.	300, 600	P G ..	—	0.20[11] 0.40[12]	—
S. Anthony[7]	KUBM	—	U.S. Shipping Board	—	P G ..	X	0.20	—
S. Antonio KOMN[6] ..	KOMN	—	Adolfo Stahl	—	—	—	—	—
S. Augustine[5] ..	KIKJ	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
S. Barbars[5]	WBJ	200	Grace S.S. Co.	300, 450, 600	P G ..	X	0.20[11] 0.40[12]	—
S. Cecilia[5]	WBB	200	Nafra Company	300, 600	P G ..	X	0.20[11] 0.40[12]	—
S. Charles[5]	KOK	200	Maru Nav. Co.	300, 600	P G ..	X	0.20[11] 0.40[12]	—
S. Clara[5]	WBA	200	Atlantic & Pacific S.S. Co. ..	300, 600	P G ..	X	0.20[11] 0.40[12]	—
S. Cruz WBD[5] ..	WBD	200	Atlantic & Pacific S.S. Co. ..	300, 600	P G ..	X	0.20[11] 0.40[12]	—
S. Diego[6]	KUBF	—	W. H. Wood	—	P G ..	—	—	—
S. Elisa..	KIGR	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
S. Eulalia	KDDV	—	American & Cuba S.S. Line ..	—	P G ..	X	—	—
S. Flavia[5]	KRUI	300	Grace S.S. Co.	300, 450, 600	P G ..	X	0.20[11]	—
S. Francisco NTQ[9] ..	NTQ	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
S. Inex[5]	WSI	100	Grace S.S. Co.	300, 600	P G ..	X	0.20[11] 0.40[12]	—
S. Jacinto[9]	KES	200	Mallory S.S. Co.	300, 450, 600	P G ..	N	0.20[11] 0.40[12]	—
S. Johns County[5] ..	KIKG	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
S. Jose KDJ[9]	KDJ	300	United Fruit Co.	300, 450, 600	P G ..	X	0.40	—
S. Jose WWL[1] ..	WWL	150	Pacific Mail S.S. Co.	300, 600	P G ..	X	0.20[11] 0.40[12]	—
S. Juan KGJ[5] ..	KGJ	300	N.Y. & Porto Rico S.S. Co. ..	300, 450, 600	P G ..	N	0.20[11] 0.40[12]	—
S. Juan KULV ..	KULV	—	Libby, McNeil & Libby	—	P G ..	—	—	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
S. Juan WWM [3]	WWM	150	Pacific Mail S.S. Co.	300, **600**	P G ..	N	0.20 [11] / 0.40 [12]	—	
S. Leonora [9]	KIML	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
S. Lorenzo KEZ [3] ..	KEZ	200	New York and Porto Rico S.S. Co.	300, **600**	P G ..	N	0.40	—	
S. Louis KDQX ..	KDQX	—	Marietta Manufacturing Co. ..	—	—	—	—	—	
S. Luisa [5]	KJEU	350	Grace S.S. Co.	300, 450, **600**	P G ..	N	0.20 [11] / 0.40 [12]	—	
S. Malta [5]	KIBN	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
S. Marcos [3]	KEK	200	Mallory S.S. Co.	300, **600**	P G ..	X	0.20 [11] / 0.40 [12]	—	
S. Marta [9]	KLG	500	United Fruit Co.	300, **600**	P G ..	N	0.40	—	
S. Mateo KLV [3] ..	KLV	300	United Fruit Co.	300, **600**	P G ..	X	0.40	—	
S. Mihiel	KDHW	—	U.S. Shipping Board	—	P G ..	N	0.20	—	
S. Nicholas [6]	WSS	100	Columbia River Packers Assn. ..	300, 525, **600**	P G ..	X	0.20	—	
S. Olivia [5]	KQII	—	Atlantic & Pacific S.S. Co. ..	—	—	—	—	—	
S. Paul KSO [5]	KSO	200	International Mercantile Marine Co.	300, **600**	P G ..	N	0.20 [11] / 0.40 [12]	—	
S. Paula [5]	WBQ	250	Grace S.S. Co.	300, **600**	P G ..	X	0.20 [11] / 0.40 [12]	—	
S. Pedro [6]	WZZ	30	Government	600	O ..	X	—	—	
S. Ramon [6]	WNW	150	San Ramon S.S. Co.	300, **600**	P G ..	X	—	—	
S. Rita WBR [5] ..	WBR	300	Grace S.S. Co.	300, 450, **600**	P G ..	X	0.40 / 0.20 [11] / 0.40 [12]	—	
S. Rita WTG [5] ..	WTG	100	Sun Company	300, **600**	P G ..	X	0.20 [11] / 0.40 [12]	—	
S. Rosa [5]	WBO	250	Grace S.S. Co.	300, 450, **600**	P G ..	X	0.20 [11] / 0.40 [12]	—	
S. Rosalia [5]	KLO	200	U.S. Steel Products Co.	300, **600**	P G ..	X	0.20 [11] / 0.40 [12]	—	
S. Tecla [5]	KNEE	150	Grace S.S. Co.	300, **600**	P G ..	X	0.20 [11] / 0.40 [12]	—	
S. Teresa [9]	WLIA	—	U.S. Shipping Board	300, **600**	P G ..	—	0.20	—	
S. Veronica [5]	KDHT	150	American & Cuban S.S. Line ..	300, **600**	P G ..	N	0.20 [11] / 0.40 [12]	—	
T—1 [9]	NILB	—	Navy	300, **600**	P G ..	N	0.20 [11] / 0.40 [12]	—	
T—2 [9]	NABB	—	Navy	300, **600**	P G ..	N	0.20 [11] / 0.40 [12]	—	

T—3[9]	NABZ	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	— —
Tacoma NUA[9] ..	NUA	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Tadousac[9]	NAZQ	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Talbot[9]..	NAPL	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Tallahassee[9]	NUC	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Tallapoosa[6]	NRE	200	U.S. Coastguard Dept.	600, 756, 952	P G ..	N	0.20[11] 0.40[12]	—
Tamesi[5]	WTV	200	Freeport & Tampico Fuel Oil Trans. Corpn.	300, 450, 600	P G ..	X	0.20[11] 0.40[12]	—
Tampa[6]	KOVX	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Tampico[6]	KOXR	—	Crowell & Thurlow S.S. Co. ..	—	P G ..	—	0.20[11] 0.40[12]	— —
Tanager[9]	NABS	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Tanamo[6]	KVN	300	Atlantic Fruit Co.	300, 450, 600	P G ..	X	0.20[11] 0.40[12]	—
Tancarville	KUKM	—	Philippine Vegetable Oil Co. ..	—	P G ..	—	—	—
Tanka[3]	KEFF	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Tarbell[9]	NEZP	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Tartar[7]	KEKS	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Tashmoo[6]	KOXD	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Tatnuck[9]	NETQ	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Tatoosh[6]	WPE	1,000	Western Fuel Co.	300, 600	P G ..	X	0.20[11] 0.40[12]	—
Tattnal[9]	NEPS	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Taylor[9]..	NALR	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Taylor NITB[9].. ..	NITB	—	—	300, 600	P G ..	N	—	—
Teal KOTC[6]	KOTC	—	Teal Company	—	P G ..	X	—	—
Teal[9]	NAPN	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Tekoa[5]	KOXF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Tenafly[3]	KOZF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Tennessee[9]	NSE	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Teresa WJF[7]	WJF	200	U.S. Shipping Board	300, 450, 600	P G ..	X	0.20	—
Tern KUFQ[6]	KUFQ	—	East Coast Fisheries Co. ..	—	P G ..	X	0.20	—
Tern NIKT[9]	NIKT	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Terre Haute[7]	KOPJ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Terry[9]	NUI	—	Navy	300, 600	P G ..	N	0.20[11] 0.40[12]	—
Texan[3]	WKT	250	Amer.-Hawaiian S.S. Co. ..	300, 600	P G ..	X	0.20[11] 0.40[12]	—
Texarkana[6]	KOCD	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Texas KUM[5]	KUM	300	Texas S.S. Co.	300, 450, 600	P G ..	X	0.20[11] 0.40[12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Texas NCD [9]	NCD	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Thala [6]	KIQQ	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Thatcher [9]	NESV	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Theodore F. Reynolds	KDDG	—	McDougall-Duluth S.B. Co. ..	—	P G ..	X	—	—	
Theodore Roosevelt	WCT	—	—	—	P G ..	—	—	—	
Thomas NIFN [9] ..	NIFN	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Thomas WXM [6] ..	WXM	300	U.S. Army Transport	600	P G ..	N	0.20 [11] 0.40 [12]	—	
Thomas H. Wheeler ..	KDOR	—	—	—	—	—	—	—	
Thompson NAZC [9] ..	NAZC	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Thornton [9]	NWX	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Thorobred [6]	KYZ	—	Lucy Work Hewitt	—	—	—	—	—	
Thrush [9]	NIKS	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Tidewater [5]	KOU	300	Nafra Company	300, 450, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Tiger KIT [5]	KIT	300	Standard Transportation Co. ..	300, 450, **600**	P G ..	X	0.20 [11] 0.40 [12]	—	
Tillamook [7]	WMOA	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Tillman [9]	NEQT	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Tingard [9]	NISB	—	—	300, **600**	P G ..	N	—	—	
Tingey [9]	NWY	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Tionesta [5]	WCA	150	Erie & Western Trans. Co. ..	300, **600**	P G ..	N	0.10	—	
Tippicanoe [9]	NUGV	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Tipton [7]	WQOA	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Tivives [3]	KMI	500	United Fruit Co.	300, **600**	P G ..	N	0.40	—	
Toiler [6]	WTOO	1000	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Toka [3]	KPAE	200	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Toledo Bridge [3] ..	KOXG	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Tollard [6]	KEVX	300	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	

[illegible]	[illegible]		U.S. Shipping Board [illegible]					
Tonesit[8]	KONK	—	U.S. Shipping Board	—	P G	X	0.20	—
Tonopah[9]	NUN	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Toopi	KULP	—	U.S. Shipping Board	—	P G	X	0.20	—
Topeka[9]	NLY	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Topila[6]	KKE	200	Southern Pacific Co.	300, 450, 600	P G	X	0.20[11] 0.40[12]	—
Tormentor KFN[3]	KFN	100	Freeport & Tampico Fuel Oil Trans. Corpn.	300, 600	P G	X	0.20[11] 0.40[12]	—
Torpedo Test Barge No. 1[9]	NIFR	—	—	300, 600	P G	N	—	—
Torpedo Test Barge No. 2[9]	NIFS	—	—	300, 600	P G	N	—	—
Torres[6]	KKF	250	Southern Pacific Co.	300, 600	P G	X	0.20[11] 0.40[12]	—
Toucey[9]	NULX	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Tours KDNB	KDNB	—	U.S. Shipping Board	—	P G	N	0.20	—
Tracey[9]	NUJL	—	Navy	330, 600	P G	N	0.20[11] 0.40[12]	—
Transportation[6]	KEJX	—	Coastwise Transportation Co.	—	—	—	—	—
Traveller[6]	KIVK	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Trenton[9]	NISR	—	—	300, 600	P G	N	0.20[11] 0.40[12]	—
Trever[9]	NUMP	—	Navy	300, 600	P G	X	0.20	—
Tri Mountain[7]	KOQF	—	U.S. Shipping Board	—	P G	X	0.20	—
Trinidadian[6]	KNO	200	Gulf Refining Co.	300, 600	P G	N	0.20[11] 0.40[12]	—
Trinity[9]	NUGX	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Tripp[3]	KIMC	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Trippe[9]	NUQ	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Triumph[3]	KEND	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
Trontolite[6]	KOM	—	Standard Oil Co. of N.J.	300, 600	—	—	—	—
Tuckahoe[6]	KJOU	125	U.S. Shipping Board	300, 450, 600	P G	X	0.20	—
Tuckanuck[3]	KIMB	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Tucker[9]	NKV	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Tuladi[7]	KOXL	—	U.S. Shipping Board	—	P G	X	0.20	—
Tulip[6]	NXX	—	Bureau of Lighthouses	300, 600	P G	N	0.20[11] 0.40[12]	—
Tulsa KIXR[3]	KIXR	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
Tulsa NIST[9]	NIST	—	—	300, 600	P G	N	0.20[11] 0.40[12]	—
Tunica[3]	WJP	150	U.S. Shipping Board	300, 600	P G	N	0.20	—
Turkey[9]	NIJF	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Turner[9]	NERO	—	Navy	300, 600	P G	N	0.20[11] 0.40[12]	—
Turrialba[8]	KDT	500	Turrialba S.S. Corpn.	300, 600	P G	N	0.40	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Tuscaloosa City	KDLO	—	U.S. Steel Products Co.	—	P G	N	—	—	
Tuscan KUDC [8]	KUDC	—	Munson S.S. Lines, Incorp.	—	P G	X	—	—	
Tuwetanka [7]	KOLG	—	U.S. Shipping Board	—	P G	X	0.20	—	
Tuxpanoil	KDPQ	—	—	—	P G	X	—	—	
Twiggs [9]	NEPV	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Tyee KENB [6]	KENB	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Tyee WPC [6]	WPC	—	U.S. Shipping Board	—	—	—	—	—	
U.117 [9]	NEXK	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Ulysses KPU [6]	KPU	300	Panama R.R. Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Umatilla [6]	KSUO	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Umpqua [9]	NATS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Unalga [9]	NRX	200	—	**600**, 756, 952	P G	N	0.20 [11] 0.40 [12]	—	
Uncas NVF [9]	NVF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Undaunted KYR [6]	KYR	—	France & Canada S.S. Corp.	—	P	X	—	—	
Unicoi [7]	KUQP	—	U.S. Shipping Board	—	P G	X	0.20	—	
Union Liberty	KUNG	—	U.S. Shipping Board	—	P G	X	0.20	—	
United States KZU [6]	KZU	300	E. H. R. Green	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Upshur [9]	NERS	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Utacarbon [6]	KUMC	—	U.S. Shipping Board	—	P G	X	0.20	—	
Utah [9]	NVE	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
V—1 NICQ [9]	NICQ	—	—	300, **600**	P G	N	—	—	
V—2 NICR [9]	NICR	—	—	300, **600**	P G	N	—	—	
V—3 NICS [9]	NICS	—	—	300, **600**	P G	N	—	—	
V—4 [9]	NICT	—	—	300, **600**	P G	N	—	—	
V—5 NICV [9]	NICV	—	—	300, **600**	P G	N	—	—	
V—6 NICX [9]	NICX	—	—	300, **600**	P G	N	—	—	
V—7 [9]	NICZ	—	—	300, **600**	P G	N	—	—	
V—8 [9]	NIDD	—	—	300, **600**	P G	N	—	—	
V—9 [9]	NIDJ	—	—	300, **600**	P G	N	—	—	
Vaba	KDIP	—	U.S. Shipping Board	—	P G	X	0.20	—	
Vacuum [6]	KUTS	—	Vacuum Oil Co.	—	P G	—	0.20	—	

Valdez [7]	WAK	100	Alaska S.S. Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Valle (El) [6]	KKW	200	Southern Pacific Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Vallonia	KULR	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Vanada [7]	KOBF	—	U.S. Shipping Board	—	P G ..	N	0.20	—
Van Camp No. II [7] ..	KDAK	150	Fish Canners' Co..	300, 600	P G ..	X	0.20	—
Vancolite	KDRG	—	Standard Oil Co. of N.J., Incorp.	—	P G ..	N	—	—
Velero [6] [10]	WHV	50	G. Allan Hancock	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Venetia WOV [6] [10] ..	WOV	100	J. D. Spreckles	300, 600	P G ..	X	—	—
Venezuela WBG [1] ..	WBG	200	Pacific Mail S.S. Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Ventura [1]	WHL	150	Oceanic S.S. Co.	300, 600, 1,800	P G ..	N	0.40	—
Vermont [9]	NVK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Vesta [5]	KTS	200	Standard Transportation Co. ..	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Vestal [9]	NMC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Victoria WAD [7] ..	WAD	100	Alaska S.S. Co.	300, 460, 525, 600	P G ..	N	0.20	—
Victorious [3]	WXIA	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Vigilant [6]	KOZP	—	E. K. Wood Lumber Co. ..	—	P G ..	—	0.20 [11] 0.40 [12]	— —
Villalobos [9]	NVP	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Vincennes Bridge [6] ..	KOXM	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Vincent [3]	KIZS	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Vinita [6]	KOTL	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Vinton County [6] ..	KORQ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Vireo [9]	NIKL	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Virginia KUV [3] ..	KUV	300	Texas Company	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Virginia NVR [9] ..	NVR	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Virginia Bridge [6] ..	KUCF	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Virginian WKV [3] ..	WKV	350	—	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Vixen [9]	NSU	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Vizcaya	WSQ	—	—	—	—	—	—	—
Volant [5]	KDON	—	Davidson Chemical Co.	—	P G ..	X	0.20	—
Volunteer WFAO [3] ..	WFAO	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Von Steuben [6]	KOXP	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Vulcan NVT [9]	NVT	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Waban [6]	KJT	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Wabash [3]	WNC	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Wachusett [3]	WJL	100	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Waco [5]	KIRP	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Wacosta	KDLM	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Wadsworth [9]	NKW	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Wahkeena [5]	WMS	200	Chas. R. McCormick & Co.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Wainwright [9]	NULF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Wakan [8]	WDIA	200	U.S. Shipping Board	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Wakanna [8]	KKOU	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Wakiki [5]	WRUU	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Wakulla [8]	KRUO	200	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Walden [5]	KIGG	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Walke [9]	NWL	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Walker NESX [9]	NESX	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Wallingford [5]	KEPV	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Wallkill [5]	KIPD	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Wallowa [7]	KQAI	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Wallula [7]	WPY	100	Port of Portland	300, 450, **600**	P G	X	0.20	—	
Walter A. Luckenbach [7]	KJIE	—	Luckenbach Co.	300, **600**	P G	X	0.20	—	
Walter D. Munson [5]	KVJ	200	Munson S.S. Lines	300, 450, **600**	P G	X	0.20	—	
Walter D. Noyes [6]	KDY	—	Crowell & Thurlow S.S. Co.	300, **600**	P G	X	—	—	
Walter Hardcastle [5]	KQB	300	Sinclair Nav. Co.	300, **600**	P G	X	0.20	—	
Walter Jennings	KDPL	—	Standard Oil Co. of N.J.	—	P G	N	—	—	
Wampum [8]	KROI	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Wana [6] [10]	KYX	100	Geo. C. Sherman	300, **600**	P	X	—	—	
Wandank [9]	NARF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Waneyanda [8]	WXIE	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Wanzu [5]	WDAU	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
Wapama [5]	WMG	100	Chas. R. McCormick & Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Warbler KDKR	KDKR	—	U.S. Shipping Board	—	P G	X	0.20	—	
Warbler [9]	NIKM	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Ward	KDQB	—	U.S. Shipping Board	—	P G	X	0.20	—	
Warren [6]	WXN	300	U.S. Army Transport	600	P G	N	0.20 [11] 0.40 [12]	—	
Warrington [9]	NWD	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	

Warszawa WLM [5] ..	WLM	300	Polish American Nav. Corp. ..	300, 600	P G ..	N	0.20	—
Wasco [1]	KKIO	200	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Washington NWE [9] ..	NWE	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Washtenaw [6]	WPOO	300	Union Oil Co. of California ..	300, 600	P G ..	X	0.20	—
Wasmuth [9]	NUKC	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Wassaic [7]	KROO	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Watauga [6]	WQT	100	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Waterbury	KUPT	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Waters [9]	NATT	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Watertown [6]	KING	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Wathena [7]	WDIE	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Watonwan [7]	WDII	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Waubesa [7]	WGOO	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Wauconda [3]	WREE	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Waukau [3]	KIDV	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Waukegan [7]	KIDX	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Wauwatosa [6]	KUCK	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Waukesha [3]	KKEO	100	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Wawalona [3]	KEXM	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Waxahachie [5]	KILM	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Wayhut [3]	WGUU	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Wayucan [6]	KKUA	200	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
W. B. Keene [6] ..	KWK	100	Savannah-N.Y. Trans. Co. ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
W. C. Teagle [5] ..	KTY	200	Standard Oil Co. of N.J. ..	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Wekika [6]	KIXX	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Welborn C. Wood [9] ..	NULJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Welles [9]	NAJZ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Wellington KMR [5] ..	KMR	100	H. W. Cook	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Wenakee [7]	WXII	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Wenatchee	KDOT	—	U.S. Shipping Board	—	P G ..	N	0.20	—
Wenonah [9]	NJJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
West Alcoz [3]	KIDD	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Alesk [3]	KJUO	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Amargosa [3] ..	KEJS	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
West Apaum [7] ..	KJUU	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
West Arroe [7]	WKS	200	U.S. Shipping Board	300, 476, 600	P G ..	X	0.20	—
West Ashawa [7] ..	KFH	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Avenal [6] ..	KENG	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Westboro [5]	KBUU	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Bridge [6]	KJOO	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Westbrook [7]	WLI	200	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
West Cactus [3]	KIVV	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Caddoa [3] ..	KODF	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
West Cadron [7]	KUDK	—	U.S. Shipping Board	—	P G ..	X	0.20	—
West Cahokia [3] ..	KUPJ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
West Cajoot [3]	KEXX	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
West Calera [7]	KUMM	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
West Calumb [3]	KILT	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Camak	KUST	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
West Campgaw [6] ..	KUFR	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
West Canon	KDCV	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
West Cape [3]	WXEO	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Carmona ..	KDFW	—	U.S. Shipping Board	—	P G ..	—	0.20	—	
West Carnifax [6] ..	KEFC	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Carruth [3] ..	KESJ	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Catanace [3] ..	KEE	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Cavanal [5] ..	KIFD	300	Imperial Shipping Corporation ..	300, **600**	P G ..	N	0.20	—	
West Cawthon [5] ..	KILZ	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Cayote [5]	KIRF	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Celeron [3] ..	KKJ	300	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
West Celina [5] ..	KEZR	—	U.S. Shipping Board	300, **600**	P G ..	—	0.20	—	
West Chatala [7]	KIPJ	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Cherow [7] ..	KJM	300	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Westchester [7]	WCL	200	U.S. Shipping Board	300, 476, **600**	P G ..	X	0.20	—	
West Cheswald [5] ..	KIXB	—	U.S. Shipping Board	300, **600**	P G ..	—	0.20	—	
West Chetac [3]	KIMG	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Coast [7]	KRAA	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Cobalt [7]	KEKD	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Cobas [5]	KNAE	300	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
West Compo [7]	KENJ	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
West Conob [3]	KIFP	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Corum [7]	KEVD	300	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
West Cressy [3]	WGOU	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Cussetta ..	KDIK	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
West Durfee [7]	KJAI	300	U.S. Shipping Board	300, 387, **600**	P G ..	X	0.20	—	
West Eagle [7]	WQZ	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Ekonk [3]	KQIU	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Elcajon [3]	KELK	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Elcasco [7] ..	WJOA	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
West Eldara [3]	WJOE	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Western Ally [7] ..	KEJF	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Western Belle [7] ..	WKUI	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Western Chief [6] ..	KNAO	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Western City [3] ..	KNAI	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Western Comet [7] ..	WXEI	300	U.S. Shipping Board	300, **600**	P G ..	N	0.10	—	

Western Hope ..	WFAI	300	U.S. Shipping Board	300, 600	P G ..	[illegible]	[illegible]	—
Western King [8] ..	WEP	150	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Western Knight [7] ..	KEFQ	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Western Light [7] ..	KQOI	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Western Maid [8] ..	KQOO	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Western Ocean [7] ..	KJEA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Western Plains [7] ..	WZIU	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Western Pride [8] ..	WGT	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Western Queen [7] ..	WWK	300	U.S. Shipping Board	300, 378, 600	P G ..	X	0.20	—
Western Scout [8] ..	WXFA	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Western Sea [3]	KNAA	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Western Spirit [8] ..	KNEA	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Western Star [8] ..	WEU	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Western States [8] ..	WED	125	Detroit & Cleveland Nav. Co. ..	300, 500, 600	P G ..	X	0.20	—
Western Wave [7] ..	WWC	300	U.S. Shipping Board	300, 600	P G ..	N	0.10	—
West Erral [8]	KERJ	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Westfield [5]	KXU	50	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Westford [8]	KNAU	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Galeta [7]	WFAE	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Galoc [8]	KVEI	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Gambo [8] ..	KQUU	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Gotomska [7] ..	WET	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
West Grama [8] ..	WGIA	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
West Grove [8]	KJAU	150	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Westhampton [8] ..	WSP	300	U.S. Shipping Board	300, 378, 600	P G ..	X	0.20	—
West Harcuvar [7] ..	KEZM	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Hardaway [8] ..	KEDX	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
West Hargrave [7] ..	KEDZ	300	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
West Harlan [8]	KEFS	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Harshaw [7] ..	KEFX	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
West Hartland [8] ..	KEGS	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Hartley [7] ..	KEGT	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
West Harts [8]	KEFZ	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
West Hassayampa [8] ..	KEGX	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Haven [7]	KJV	200	U.S. Shipping Board	300, 450, 600	P G ..	—	0.20	—
West Helix [7]	WSUA	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Hematite [8] ..	KEZP	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
West Hembrie [8] ..	KEZN	300	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
West Henshaw [7] ..	KEBQ	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
West Hepburn [7] ..	KINP	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
West Hesseltine [7] ..	KOTN	—	U.S. Shipping Board	—	P G ..	N	0.20	—
West Hika [3]	KOZK	—	U.S. Shipping Board	—	P G ..	X	0.20	—
West Himrod [7] ..	KUDQ	—	U.S. Shipping Board	—	P G ..	X	0.20	—
West Hixton	KUKV	—	U.S. Shipping Board	—	P G ..	X	0.20	—
West Hobomac [7] ..	WFAI	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
West Honaker.. ..	KDFX	—	U.S. Shipping Board	—	P G ..	—	0.20	—
West Hosokie [7] ..	WFEI	300	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
West Humhaw [8] ..	WZAE	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
West Imboden [8] ..	KECX	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
West Indian [7]	KJAE	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
West Inskip [5]	KITZ	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
West Ira [3]	KOGL	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Irmo [5]	KIFB	300	Imperial Shipping Corporation	300, **600**	P G	N	0.20	—	
West Islay [5]	KICP	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
West Isleta [5]	KICQ	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
West Islip [7]	KIKX	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
West Ison [5]	KINN	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
West Ivan [3]	KOZS	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Ivis [3]	KOQQ	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Jaffrey [5]	KOCX	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
West Jappa [3]	KUKJ	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Jena [3]	KOTG	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Jessup [5]	KOXS	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Jester [3]	KUDG	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Kader [7]	KOSL	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Kasson [8]	KIKM	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
West Katan [6]	KOBK	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
West Keats [7]	KUQK	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Keene [8]	KISK	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
West Kyska [6]	WJOU	—	U.S. Shipping Board	300, **600**	P G	—	0.20	—	
West Lake [7]	WTH	300	U.S. Shipping Board	300, 378, **600**	P G	X	0.20	—	
Westland [7]	KJX	100	U.S. Shipping Board	300, 450, 525, **600**	P G	X	0.20	—	
West Lashaway [7]	WREA	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
West Lianga [8]	KJAO	300	U.S. Shipping Board	300, 376, **600**	P G	X	0.20	—	
West Loquassuck [7]	WJOI	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
West Madaket [8]	WJOO	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
West Mahomet [7]	WTUU	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
West Mahwah [3]	KUTC	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Maximus [8]	KEDQ	—	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Westmead [6]	WDIO	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
West Mingo [7]	KORB	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Modus [8]	KENK	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
West Montop [7]	KOTR	—	U.S. Shipping Board	—	P G	X	0.20	—	
Westmoreland KIQC [8]	KIQC	300	U.S. Shipping Board	300, **600**	P G	N	0.20	—	
Westmount [8]	KBUO	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
West Munham [7]	KEXF	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
West Neris [8]	KOTK	—	U.S. Shipping Board	—	P G	X	0.20	—	
West Niger [8]	KOZJ	—	U.S. Shipping Board	—	P G	X	0.20	—	

West Nilus [7]	KUFJ	—	U.S. Shipping Board		P G	X	0.20	—
West Nivaria [7]	KUQJ	—	U.S. Shipping Board	—	P G	X	0.20	—
West Nolno [8]	KENG	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
West Nomentum	KUSG	—	U.S. Shipping Board	—	P G	X	0.20	—
West Nosska [8]	KEDV	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Westoil [5]	KIVP	—	San Juan Fishing & Packing Co.	300, 600	—	—	—	—
West O'Rowa	KDQI	—	U.S. Shipping Board	—	P G	X	0.20	—
West Pocasset [6]	KOCK	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
West Point [8]	KJY	150	U.S. Shipping Board	300, 450, 600	P G	N	0.20	—
Westpool [8]	WROA	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Westport [5]	WFEO	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
West Quechee [8]	KEDT	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
West Raritans [8]	KIXC	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
West Saginaw [5]	KOCV	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
West Segovia [7]	KIPK	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
West Selene [3]	KIXZ	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
West Sequana [8]	WSOI	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
West Shore [6]	WMD	100	U.S. Shipping Board	300, 600	P G	X	0.20	—
West Tacook [3]	KECR	200	U.S. Shipping Board	300, 600	P G	X	0.20	—
West Togus [3]	KEXJ	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
West Totant [8]	KEXK	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
West Vaca [3]	KEMX	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
West View [7]	WDIU	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
West Virginia [8]	NEDJ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Westward Ho [7]	WKX	50	U.S. Shipping Board	300, 600	P G	X	0.20	—
West Wauna [7]	WSUE	—	U.S. Shipping Board	300, 600	P G	N	0.20	—
West Wauneke [8]	WSUI	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Westwego [6]	KGE	200	Union Petroleum S.S. Co.	300, 450, 600	P G	X	0.20 [11] 0.40 [12]	—
West Wind [7]	KJH	100	U.S. Shipping Board	300, 600	P G	X	0.20	—
Westwood [7]	WTF	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
West Zeda [3]	WKUU	—	U.S. Shipping Board	300, 600	P G	X	0.20	—
West Zucker [7]	WJIA	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
West Zula [3]	WQEO	300	U.S. Shipping Board	300, 600	P G	X	0.20	—
W. F. Burrows [6]	WHG	250	Libby, McNeil & Libby	300, 425, 525, 600	P G	X	0.20 [11] 0.40 [12]	—
W. F. White [6]	WGC	200	Limestone Transportation Co.	300, 450, 600	P G	X	0.10	—
Wheatland Montana [5]	KISF	—	U.S. Shipping Board	300, 600	P G	—	0.20	—
Wheaton [5]	WMUA	300	U.S. Shipping Board	300, 600	P G	N	0.20	—
Wheeling [9]	NWH	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Wheeling Mold	KUMN	—	U.S. Shipping Board	—	P G	X	0.20	—
Whipple [9]	NUNL	—	—	300, 600	P G	N	—	—
Whippoorwill [9]	NIJQ	—	Navy	300, 600	P G	N	0.20 [11] 0.40 [12]	—
Whitemarsh [6]	KOMG	—	F. R. Payne	—	—	—	—	—
Whitney [9]	NIRL	—	—	300, 600	P G	N	—	—
Whittier [1]	WHT	150	Union Trans. Co.	300, 600, 1,800	P G	X	0.20 [11] 0.40 [12]	—
W. H. Libby	KDMP	—	Standard Oil Co. of N.J., Inc.	—	P G	X	0.20 [11] 0.40 [12]	—
W. H. McGean [6]	WMIO	150	Stadacona S.S. Co.	300, 600	P G	X	0.20 [11] 0.40 [12]	—
W. H. Tilford [6]	KPD	200	Standard Oil Co. of N.J.	300, 600	P G	X	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
UNITED STATES OF AMERICA—*contd.*							Francs.	Francs.	
Wicasta [6]	KIJG	—	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Wichita	KDMU	—	U.S. Shipping Board	—	P G	N	0.20	—	
Wickes [9]	NATJ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Wico [5]	KNN	200	Standard Oil Co. of N.J.	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
Widgeon KOSB [6]	KOSB	—	Widgeon Company	—	P G	X	0.20	—	
Widgeon NAQF [6]	NAQF	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Wihaha [3]	WDEA	200	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
Wild Duck [5]	KYG	—	Gulf Refining Co.	—	P G	X	0.20	—	
Wild Goose [6]	KOTS	—	Wild Goose Company	—	P G	X	0.20	—	
Wildwood [7]	KORV	—	U.S. Shipping Board	—	P G	X	0.20	—	
Wilhelmina [5]	WMO	250	Matson Nav. Co.	300, 450, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Wilkes [9]	NKQ	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Willamette [5]	WSW	100	Willamette S.S. Co.	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Willet [9]	NIKN	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
Willett	KDKS	—	U.S. Shipping Board	—	P G	X	0.20	—	
William A. McKenney [6]	WOM	—	Crowell & Thurlow S.S. Co.	—	—	—	—	—	
William A. Reiss [5]	WNI	200	Reiss S.S. Co.	300, **600**	P G	X	0.10	—	
William A. Whitney [5]	KUSS	—	Whitney Brothers Co.	—	P G	X	—	—	
William B. Preston [9]	NUMQ	—	Navy	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
William G. Mather [5]	KKUI	150	Cleveland Cliff Iron Co.	300, 450, **600**	P G	X	0.10	—	
William Green [5]	WIY	250	Petroleum-Trans. Co.	300, 450, **600**	P G	X	0.20 [11] 0.40 [12]	—	
William H. Doheny	KDKG	—	—	—	—	—	—	—	
William H. Webb [7]	KOZV	—	U.S. Shipping Board	—	P G	X	0.20	—	
William Isom [5]	KVY	200	U.S. Shipping Board	300, 450, **600**	P G	X	0.20	—	
William Jones [9]	NARR	—	Navy	300, **600**	P G	N	0.20 [11] 0.40 [12]	—	
William M. Mills [6]	KEJT	200	Wm. M. Mills	300, **600**	P G	X	0.20 [11] 0.40 [12]	—	
William N. Page [6]	WFOO	300	U.S. Shipping Board	300, **600**	P G	X	0.20	—	
William Penn	KDGV	—	U.S. Shipping Board	—	P G	X	0.20	—	

Williams [9]	NENT	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Williamson [9]	NUNS	—	—	300, 600	P G ..	N	—	—
Willimantic [9]	KMIO	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Willoughby [9]	NJX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Willpolo [5]	KOBM	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Willsolo [3]	KUDL	—	U.S. Shipping Board	—	P G ..	N	0.20	—
Wilmington [9]	NWK	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Wilscox [3]	WPAO	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Windber [5]	WND	300	Pacific-Amer. Fisheries	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Winding Gulf [9] ..	WFEE	300	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Winifred [3]	KTE	200	Gulf Refining Co.	300, 600	P G ..	X	0.20 [11] 0.40 [12]	—
Winnebago KTEI [9] ..	KTEI	300	Foreign Trans. & Mercantile Corpn.	300, 450, 525, 600	P G ..	X	0.30	—
Winneconne	KDFY	—	Winneconne S.S. Corp.	—	P G ..	—	—	—
Winona [5]	KUNV	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Winona County [9] ..	KIZR	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Winslow [9]	NJA	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Winston-Salem ..	KUJS	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Winyah [7]	KIMM	—	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Wisconsin [9]	NWM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Wisconsin Bridge [9] ..	KIBM	—	French American Line	300, 600	P G ..	X	0.40	—
Wisdom II	KDNM	—	E. A. Salisbury	—	—	—	—	—
Wiskah [7]	KNEU	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Wisla [6]	KOTP	—	Polish-American Nav. Corp. ..	—	—	—	—	—
Wisteria [6]	KOJN	—	Foreign & Domestic Transportation Corp.	—	P G ..	X	0.20	—
W. J. Hanna	KDKX	—	Standard Oil Co.	—	P G ..	X	—	—
W. L. Steed [5]	WSEE	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Wm. Boyce Thompson [5]	KDHS	—	—	—	P G ..	—	0.20	—
W. M. Burton [9] ..	KMIU	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Wm. F. Herrin [1] ..	WTN	150	Assoc. Oil Company	300, 600, 1,800	P G ..	X	0.20 [11] 0.40 [12]	—
Wm. G. Warden [5] ..	KNF	250	Standard Oil Co. of N.J.	300, 450, 600	P G ..	X	0.20 [11] 0.40 [12]	—
W. M. Irish [9]	KJOE	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
W. M. Tupper [9] ..	WJR	—	Gulf & Southern S.S. Co. ..	300, 600	P G ..	X	—	—
Wolverine [9]	NGW	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Wolverine State ..	KDMQ	—	U.S. Shipping Board	—	P G ..	N	0.20	—
Wompatuck [9]	NVJ	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Wonabbe [9]	KIBX	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Wood [9]	NUMF	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Woodbury [9]	NATM	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Woodcock NIKP [9] ..	NIKP	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—

Ship Stations—*Continued*

Name.	Call Signal.	Normal Range in Nautical Miles.	Shipping Line or Ship Owner.	Wavelengths in Metres (the Normal Wavelength in Heavy Type).	Nature of Service Performed.	Hours of Service.	Ship Charge. Per Word.	Ship Charge. Minimum per Radio-telegram.	Remarks.
							Francs.	Francs.	
UNITED STATES OF AMERICA—*contd.*									
Woodman [3]	KIBP	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Woodmansie [7]	KIPF	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Woonsocket [5]	WCW	300	U.S. Shipping Board	300, 450, **600**	P G ..	X	0.20	—	
Worcester [7]	KIKL	300	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Worden [9]	NUNM	—	—	300, **600**	P G ..	N	—	—	
Wotan KDGE	KDGE	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Woyaca [7]	KETK	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Wright [9]	NIRM	—	—	300, **600**	P G ..	N	—	—	
W. S. Miller	KDMB	—	—	—	—	—	—	—	
W. S. Porter [3]	WTM	150	Assoc. Oil Company	300, **600**, 1,800	P G ..	X	0.20 [11] 0.40 [12]	—	
W. S. Rheem [9] ..	WGAO	300	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Wyandotte WCO [5] ..	WCO	100	Wyandotte Trans. Co.	300, 500, **600**	P G ..	X	0.10	—	
Wyandotte WJW [7] ..	WJW	300	U.S. Shipping Board	300, 450, **600**	P G ..	N	0.20	—	
Wynooche [9]	KFE	—	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Wyoming NWQ [9] ..	NWQ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Wytheville [9]	KITL	—	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Xarifa [9]	NEFX	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Yacona [9]	NUDP	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Yadkin [9]	KWL	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Yaka	KDDF	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Yakima [7]	KNUI	200	U.S. Shipping Board	300, **600**	P G ..	X	0.20	—	
Yaklok [9]	KIGX	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Yale [9]	NOQ	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Yalza	KDJK	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Yamacraw [9]	NRY	200	U.S. Coastguard Dept. ..	**600**, 752, 952	P G ..	N	0.20	—	
Yamhill [9]	WVIE	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Yankton [9]	NSK	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Yapalaga [9]	KDHK	—	U.S. Shipping Board	—	P G ..	X	0.20	—	
Yaquina [9]	KENF	300	U.S. Shipping Board	300, **600**	P G ..	N	0.20	—	
Yarborough NUMC [9]	NUMC	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	
Yarnall [9]	NIGS	—	Navy	300, **600**	P G ..	N	0.20 [11] 0.40 [12]	—	

York Harbor [6]	KOJB	—	U.S. Shipping Board	—	P G ..	X	0.20	—
Yorktown [8]	NQX	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Yosemite KYS [5] ..	KYS	150	U.S. Shipping Board	300, 476, 600	P G ..	X	0.20	—
Young [8]	NESG	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Youngstwon [7]	KIFX	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Yucatan [3]	WLG	200	New York & Cuba Mail S.S. Co...	300, 450, 600	P G ..	N	0.40	—
Yucca KWJ [7]	KWJ	200	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Yukon [5]	WXEU	300	U.S. Shipping Board	300, 600	P G ..	N	0.20	—
Yuma [6]	WJAI	150	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Zacapa [8]	KLE	500	United Fruit Co.	330, 600	P G ..	N	0.40	—
Zane [8]	NUMN	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Zapora [7]	WPQ	100	Booth Fisheries Co.	300, 600	P G ..	X	0.20 [11]	—
Zarembo [8]	KICS	—	U.S. Shipping Board	300, 600	P G ..	—	0.20	—
Zavalla [5]	KEVC	200	Nacirema S.S. Corpn.	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Zeilin [8]	NUMB	—	Navy	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Zenith [8]	KZE	—	Chas. Longstreth	—	—	—	—	—
Zirkel [3]	WREO	—	U.S. Shipping Board	300, 600	P G ..	X	0.20	—
Zizania [8]	NZZ	—	Bureau and Lighthouses ..	300, 600	P G ..	N	0.20 [11] 0.40 [12]	—
Zulia [6]	KDZ	200	Atlantic & Caribbean S.N. Co. ..	300, 450, 600	P G ..	N	0.20 [11] 0.40 [12]	—
URUGUAY								
Baron de Rio Branco	CWG	55	Navy	450, 600	O ..	—	—	—
Diez y ocho de Julio	CWF	55	Navy	450, 600	O ..	—	—	—
Ingeniero	CWH	55	Navy	600	O ..	—	—	—
Montevideo CWE ..	CWE	220	Navy	450, 600	O ..	—	—	—
Oyarvide	CWI	55	Hydrographic Service	450, 600	O ..	—	—	—
Uruguay CWD ..	CWD	220	Navy	450, 600	O ..	—	—	—

INTERNATIONAL ALLOCATION OF CALL LETTERS

THE BUREAU INTERNATIONAL DE L'UNION TELEGRAPHIQUE OF BERNE allots to the various nations who are parties to the International Radiotelegraphic Convention combinations of " call " letters, which are in turn allotted to ship and land stations. Below we give a list of the letters, and combinations of letters, and the countries to which these have been assigned.

Call letters	Country
A	Germany.
B	Great Britain.
CAA to CEZ	Chile.
CFA to CKZ	British Possessions and Protectorates.
CLA to CMZ	Spain.
CNA to CNZ	Morocco.
COA to COZ	Great Britain.
CPA to CPZ	Bolivia.
CQA to CQZ	Monaco.
CRA to CRZ	Portuguese Colonies.
CSA to CUZ	Portugal.
CVA to CVZ	Roumania.
CWA to CWZ	Uruguay.
CXA to CXZ	Spain.
CYA to CZZ	Mexico.
D	Germany.
EAA to EHZ	Spain and Colonies.
EIA to EZZ	Great Britain.
F	France, French Colonies and Protectorates.
G	Great Britain.
HAA to HAZ	Hungary.
HBA to HBZ	Switzerland.
HCA to HCZ	Ecuador.
HDA to HEZ	*Not yet allotted.*
HFA to HFZ	Yugo-Slavia
HGA to HHZ	Siam.
HIA to HIZ	Dominican Republic.
HJA to HKZ	Colombia.
HLA to HNU	Spain.
HNV to HNZ	New Hebrides.
HOA to HZZ	France, French Colonies and Protectorates.
I	Italy and Colonies.
J	Japan and Possessions.
KAA to KCZ	Germany.
KDA to KZZ	United States of America
LAA to LHZ	Norway.
LIA to LRZ	Argentina.
LSA to LUZ	Great Britain.
LVA to LVZ	Guatemala.
LWA to LWZ	Norway.
LXA to LZZ	Bulgaria.
M	Great Britain.
N	United States of America.
OAA to OBZ	Peru.
OCA to OFZ	Great Britain.
ONA to OTZ	Belgium and Colonies.
OGA to OIZ	Denmark.
OJA to OMZ	*Not yet allotted.*
OUA to OZZ	Denmark.
PAA to PIZ	Netherlands.
PJA to PJM	Curaçao.
PJN to PJZ	Surinam.
PKA to PMZ	Dutch Indies.
PNA to PPZ	Brazil.
PQA to PSZ	Portugal.
PTA to PVZ	Brazil.
PWA to PWZ	Cuba.
PXA to PZZ	Netherlands.
Q	*Reserved for abbreviations.*
R	Russia.
SAA to SMZ	Sweden.
SNA to STZ	Brazil.
SUA to SUZ	Egypt.
SVA to SZZ	Greece.
TAA to TEZ	Turkey.
TFA to TFZ	Iceland.
TGA to THZ	Greece.
TIA to TOZ	Spain.
TPA to TUZ	Norway.
TVA to TZZ	Netherlands.
UAA to UMZ	France, French Colonies and Protectorates.
UNA to UNZ	*Not yet allotted.*
UOA to UOZ	Austria.
UPA to UPZ	Italy.
VAA to VGZ	Canada.
VHA to VKZ	Australian Commonwealth.
VLA to VMZ	New Zealand.
VNA to VNZ	Union of South Africa.
VOA to VOZ	Newfoundland.
VPA to VSZ	British Colonies and Protectorates not autonomous.
VTA to VWZ	British India.
VXA to VZZ	British Colonies and Protectorates.
W	United States of America.
XAA to XDZ	Mexico.
XEA to XMZ	Great Britain.
XNA to XSZ	China.
XTA to XZZ	Great Britain
Y	Great Britain.
Z	Great Britain.

CALL LETTERS

(Alphabetically arranged)

ALLOTTED TO LAND AND SHIP STATIONS.

b = Ship Station. *c* = Land Station.

		PAGE			PAGE
ANK	*b.* Reael	681	ARA	*b.* Borghild	765
ANL	*b.* Baud	681	ARB	*b.* Rolf Jarl	771
ANM	*b.* Maetsuycher ..	681	ARC	*b.* Ovre	770
ANN	*b.* Siak..	682	ARD	*b.* Steinstad	772
ANO	*b.* Tarakan	682	ARE	*b.* Stiklestad	772
ANP	*b.* Van Hoorn ..	682	ARF	*b.* Skogstad	771
ANQ	*b.* Swaerdecroom ..	682	ARG	*b.* Tune	773
ANR	*b.* Reyniersz	681	ARH	*b.* Seirstad	771
ANS	*b.* De Haan	681	ARI	*b.* Ellen Stub.. ..	765
ANT	*b.* Van Swoll ..	683	ARJ	*b.* Storaker	772
ANU	*b.* Siam ANU	682	ARK	*b.* Avona	764
ANV	*b.* Mossel	681	ARL	*b.* Montana ARL ..	769
ANW	*b.* Van Noort ..	682	ARM	*b.* Lovstakken ..	769
ANX	*b.* Van den Bosch ..	682	ARN	*b.* Tizona	773
ANY	*b.* Camphuys	681	ARO	*b.* Torrey	773
ANZ	*b.* Van Lansberge ..	682	ARP	*b.* M. H. Kongshavn..	769
AOA	*b.* Elout	681	ARQ	*b.* Bjornefjord.. ..	765
AOB	*b.* Duymaer van Twist	681	ARR	*b.* Skolma	771
AOC	*b.* De Weert	681	ARS	*b.* Einar Jarl	765
AOD	*b.* Van Riemsdyk ..	683	ART	*b.* Ragnvald Jarl ..	770
AOE	*b.* Myer	681	ARU	*b.* Bueland	765
AOF	*b.* De Klerk	681	ARV	*b.* Cleveland ARV ..	765
AOG	*b.* Loudon	681	ARW	*b.* Maud	769
AOH	*b.* Van Riebeech ..	682	ARX	*b.* Carmen ARX ..	765
AOI	*b.* Rochussen ..	681	ARY	*b.* Caballero	765
AOJ	*b.* Buyskes	681	ARZ	*b.* Melderskin	769
AOK	*b.* Schouten	682	ASA	*b.* Sarpen ASA ..	771
AOT	*b.* California	681	ASB	*b.* Topdalsfjord ..	773
APG	*b.* Gemma	681	ASC	*b.* Idefjord	767
APO	*b.* Orion APO ..	681	ASD	*b.* Bergsdalen	764
APS	*b.* Serdang	682	ASE	*b.* Skrymer	771
AQA	*b.* Nordnaes	770	ASF	*b.* Olaf Kyrre.. ..	770
AQB	*b.* Hjortnaes	767	ASG	*b.* Karmoy	768
AQC	*b.* Frey	766	ASH	*b.* Marita	769
AQD	*b.* Liv	769	ASJ	*b.* Belfri	764
AQE	*b.* Freden	766	ASK	*b.* Tordenskjold ASK	773
AQF	*b.* Askeladden.. ..	764	ASL	*b.* Talisman	772
AQG	*b.* Thor I	773	ASM	*b.* Tyr	773
AQH	*b.* Salina AQH ..	771	ASN	*b.* Bretagne ASN ..	765
AQI	*b.* Vestland	773	ASO	*b.* Ek	765
AQJ	*b.* Haugland	767	ASP	*b.* Bolette	765
AQK	*b.* Gavennören ..	767	ASQ	*b.* Tabor	772
AQL	*b.* Holmborg	767	ASR	*b.* H. C. Flood ..	767
AQM	*b.* Kongsgaard ..	768	ASS	*b.* Svane	772
AQN	*b.* Otto Sverdrup ..	770	AST	*b.* Hubro	767
AQP	*b.* Solborg	771	ASU	*b.* Laura Skogland ..	769
AQQ	*b.* Hendrik Lund ..	767	ASV	*b.* Langtind	769
AQR	*b.* Sekstant	771	ASW	*b.* Terne	772
AQS	*b.* Solvang	771	ASX	*b.* Lifjeld	769
AQT	*b.* Tolosa	773	ASY	*b.* Tela	772
AQU	*b.* Duro	765	ASZ	*b.* Tricolor	773
AQV	*b.* Gröntoft	767	ATA	*b.* Terrier	772
AQW	*b.* Inger Benedicte ..	767	ATB	*b.* Guernsey	767
AQX	*b.* Wagland	773	ATC	*b.* Falk..	766
AQY	*b.* Spette	772	ATD	*b.* Cubano	765
AQZ	*b.* Aslaug Haaland ..	764	ATE	*b.* America ATE ..	764

		PAGE			PAGE
ATF	*b.* Svartfond	772	BAA	*b.* Corbank	825
ATG	*b.* Heina	767	BAB	*b.* Trevalgan	887
ATH	*b.* Skard	771	BAD	*b.* Baymanter ..	810
ATI	*b.* Kapolna	768	BAF	*b.* Baylula	809
ATJ	*b.* Gran	766	BAH	*b.* Claymont	824
ATK	*b.* Asturias ATK ..	764	BAM	*b.* Prairial	871
ATL	*b.* Haugarland ..	767	BAN	*b.* Sunray	882
ATM	*b.* Alm	764	BAR	*b.* Vitellia	891
ATN	*b.* Modemi	769	BAS	*b.* Oreland	865
ATO	*b.* Thomas Krag ..	773	BAU	*b.* Baron Inchcape ..	809
ATP	*b.* Songelv	772	BAV	*c.* Evère, Brussels ..	570
ATQ	*b.* Proteus ATQ ..	770	BAW	*b.* Rio Preto	875
ATR	*c.* Atbara	627	BBH	*b.* Butetown ..	815
ATR	*b.* Havur	767	BBJ	*b.* City of Belfast ..	819
ATS	*b.* Aladdin	763	BBM	*b.* Mount Berwyn ..	860
ATT	*b.* Aalesund	763	BBO	*b.* Thamesmede ..	886
ATU	*b.* Konsul Olsen ..	768	BBQ	*b.* Tynemede	889
ATV	*b.* Tugela	773	BBS	*b.* Colonia BBS ..	825
ATW	*b.* Christian Michelsen	765	BBV	*b.* Corcrest	825
ATX	*b.* Leseps	769	BBW	*b.* Ripley Castle ..	875
ATY	*b.* Kaprino	768	BBX	*b.* Milton	859
ATZ	*b.* Jacob Christensen..	768	BCB	*b.* Greleden	839
AUA	*b.* Kapland	768	BCC	*b.* Blackhill	811
AUB	*b.* Gurth	767	BCD	*b.* City	818
AUC	*b.* Condor AUC ..	765	BCE	*b.* Zelo	895
AUD	*b.* Alf	764	BCG	*b.* Commodore ..	825
AUE	*b.* Salonica	771	BCH	*b.* Counsellor	826
AUF	*b.* Basis	764	BCJ	*b.* M. S. Dollar ..	861
AUG	*b.* Unita	773	BCP	*b.* Canadier	815
AUH	*b.* Rutenfjel	771	BCQ	*b.* Cardigan	816
AUI	*b.* Eldrid	765	BCR	*b.* Anglesea	804
AUJ	*b.* Orla	770	BCS	*b.* Leominster ..	850
AUK	*b.* Mons	769	BCT	*b.* Southlea	881
AUL	*b.* Klosterfos	768	BCU	*b.* Hilarius	842
AUM	*b.* Nord AUM.. ..	769	BCV	*b.* Northern	863
AUN	*b.* Edith Fische ..	765	BCZ	*b.* Apsleyhall ..	805
AUO	*b.* Aztec AUO ..	764	BDB	*b.* Karoa	847
AUP	*b.* Björkelund ..	765	BDC	*b.* Glenaffric	837
AUQ	*b.* Inneröy	767	BDD	*b.* Corby	825
AUR	*b.* Ringhorn	770	BDE	*b.* Coquetmede ..	825
AUS	*b.* Haukefjell	767	BDF	*b.* Clydesdale ..	825
AUT	*b.* Ravnefjell	770	BDH	*b.* Dictator	829
AUU	*b.* Marshall	769	BDI	*b.* Patrician	867
AUV	*b.* Royal	771	BDJ	*b.* Westborough ..	893
AUW	*b.* Nordkyn AUW ..	769	BDK	*b.* Newquay	862
AUX	*b.* Erviken	766	BDM	*b.* Burgandy	814
AUY	*b.* Asborg	764	BDN	*b.* Lady Cloe ..	849
AUZ	*b.* Tiger AUZ.. ..	773	BDO	*b.* Benmohr	811
AVA	*b.* Skogland	771	BDP	*b.* Southern Coast ..	881
AVB	*b.* Bygdonaes	765	BDQ	*b.* Priestfield	871
AVC	*b.* Ruth AVC ..	771	BDR	*b.* Swinburne	883
AVD	*b.* Romulus AVD ..	771	BDS	*b.* City of Birmingham	819
AVE	*b.* Hallgrim	767	BDT	*b.* Pembroke	867
AVF	*b.* Hundvaago	767	BDU	*b.* Valette (La) ..	850
AVG	*b.* S. Paulo AVG ..	772	BDV	*b.* Visigoth	891
AVH	*b.* Sixtyfour	771	BDY	*b.* Buckleigh	814
AVI	*b.* Rodfjell	770	BDZ	*b.* Betwa	811
AVJ	*b.* Gezina	766	BEA	*b.* Frankby	835
AVK	*b.* Gefion	766	BEB	*b.* Reval BEB ..	874
AVL	*b.* Dampen	765	BEC	*b.* Strathearn	882
AVM	*b.* Dampto	765	BEF	*b.* Elswick Tower ..	832
AVN	*b.* Valdemar Skogland	773	BEJ	*b.* Huntsclyde.. ..	844
AVO	*b.* Tana	772	BEK	*b.* Brenden	813
AVP	*b.* Harriet	767	BEL	*b.* Bayford	809
AVQ	*b.* Liss	769	BEM	*b.* Bardic	808
AVR	*b.* Uraed	773	BEN	*b.* Stroma	882
AVT	*b.* Geisha	766	BEO	*b.* Belize	810
AVU	*b.* Remus AVU ..	770	BEP	*b.* Kamouraska ..	847
AVV	*b.* Sagaland AVV ..	771	BEQ	*b.* Dewsbury	829

		PAGE
BER	*b.* Felixstowe	834
BET	*b.* Menelaus	858
BEU	*b.* Crosshill	827
BEX	*b.* Majestic BEX	854
BFA	*b.* Dumfries	830
BFB	*b.* Greenwich	839
BFD	*b.* Spartan Prince	881
BFE	*b.* Royal Sceptre	876
BFG	*b.* Euterpe	833
BFH	*b.* Eastgate	831
BFI	*b.* Herouspool	842
BFJ	*b.* Lowlands	852
BFK	*b.* Specialist	881
BFL	*b.* Ulversmead	889
BFM	*b.* Madawaska	853
BFO	*b.* Gardenia	836
BFP	*b.* River Wye	875
BFS	*b.* Gyp	840
BFV	*b.* Frinton	835
BFW	*b.* Petingaudet	868
BFX	*b.* Glenfinlas	837
BFY	*b.* Poldennis	869
BFZ	*b.* Polperro	869
BGE	*b.* Bolingbroke	812
BGH	*b.* Marshal Plumer	857
BGI	*b.* Nina (La)	850
BGK	*b.* Rio Negro BGK	874
BGL	*b.* Ridley	874
BGN	*b.* Newbigging	862
BGO	*b.* Crawford Castle	827
BGP	*b.* Ulidia	889
BGS	*b.* Harlem	841
BGU	*b.* Rochdale	875
BHC	*b.* Delambre	828
BHD	*b.* Jekri	846
BHF	*b.* Pilar de Larrinaga	869
BHH	*b.* Hatipara	841
BHI	*b.* Glamorganshire	837
BHL	*b.* Nucula	864
BHP	*b.* Ngakuta	863
BIA	*c.* Bunia-Kilo	569
BJJ	*b.* Marsden	857
BJQ	*b.* Cymric Pride	827
BJV	*b.* Gothic	838
BJW	*b.* Gwynmead	840
BJX	*b.* Princess	872
BKB	*b.* Ellaline	832
BKG	*b.* Ennisbrook	832
BKM	*b.* Corglen	826
BKN	*b.* Kirktown	848
BKO	*b.* Mackworth	853
BKR	*b.* Bellglade	810
BKZ	*b.* Fullerton	835
BLB	*b.* Kandy	847
BLD	*b.* Kasara	847
BLE	*b.* Glynymel	838
BLF	*b.* Mercedes BLF	858
BLH	*b.* Polbain	869
BLJ	*b.* S. Theresa	884
BLN	*b.* British Major	813
BLP	*b.* Portgwarra	870
BLV	*b.* Umgeni	889
BLW	*b.* Umona	889
BLY	*b.* Warturm	892
BMB	*b.* Newaster	862
BMD	*b.* Havildar	841
BMK	*b.* Bothwell	812
BMN	*b.* Twilight	888
BMO	*b.* Corton	826
BMQ	*b.* Keyingham	848
BMR	*b.* Loughborough	852
BMT	*b.* Trewidden	888
BMZ	*b.* Armagh	806
BNA	*b.* Tregothnan	887
BNB	*b.* Melita	858
BNC	*b.* Ormonde	865
BND	*b.* Rosefield	876
BNE	*b.* Riverton	875
BNF	*b.* Brighton BNF	813
BNG	*b.* Jura...	846
BNI	*b.* Strathlorne	882
BNK	*b.* Mourino	861
BNL	*b.* Hurliness	844
BNO	*b.* Coylet	827
BNQ	*b.* Turkestan	888
BNW	*b.* Dunolly	830
BNX	*b.* Chiswick	818
BNY	*b.* Pencisely	867
BOA	*b.* Bideford	811
BOB	*b.* Blairmore	812
BOD	*b.* British Light	813
BOE	*b.* Ulua	889
BOF	*b.* Frankinver	835
BOH	*b.* Polcrest	869
BOI	*b.* British Star	814
BOJ	*b.* Actor	802
BOL	*b.* General Church	836
BOM	*b.* Ethelwynne	833
BON	*b.* British Lantern	813
BOP	*b.* Clydemede	825
BOQ	*b.* Thistlemore	886
BOR	*b.* Scottish Bard	878
BOR	*b.* Tecumseh	728
BOU	*b.* British Beacon	813
BOV	*b.* Woldingham	894
BOW	*b.* Holtby	843
BOX	*b.* Admiral Codrington	802
BOY	*b.* Margha	856
BOZ	*b.* Katanga	847
BPB	*b.* Dogra	829
BPG	*b.* Braunfels	813
BPU	*b.* Holbrook	843
BPW	*b.* Anatina	804
BPY	*b.* Adna	802
BQE	*b.* Ronan	875
BQF	*b.* Whinfield	893
BQK	*b.* Greldon	839
BQM	*b.* Anomia	804
BQO	*b.* Acasta	802
BQP	*b.* Grelbank	839
BQQ	*b.* Elzasier	832
BQU	*b.* New York City	863
BQV	*b.* Wells City	893
BQW	*b.* Exeter City	833
BQX	*b.* Chicago City	818
BQZ	*b.* Perez	868
BRA	*b.* Jehangir	728
BRB	*b.* Brockvale	814
BRE	*b.* City of Windsor	820
BRE	*b.* Kahira (El)	846
BRG	*b.* Esturia	833
BRI	*b.* Frankenfels	835
BRM	*b.* Hunnie	843
BRP	*b.* Joffre	846
BRS	*b.* Gibel Yedid	837
BRY	*b.* Professor BRY	872
BRZ	*b.* Ravenstone	873
BSK	*b.* Hunslet	843

		PAGE
BSL	*b.* Min ..	859
BSN	*b.* Ryde	877
BSO	*b.* Roker	875
BSQ	*b.* Purnea	872
BSR	*b.* Bryntawe	814
BTA	*b.* Koursk BTA	849
BTC	*b.* War Mehtar	892
BTD	*b.* Comino	825
BTF	*b.* William Balls	893
BTK	*b.* Eros BTK ..	833
BTP	*b.* Moorby	860
BTR	*b.* Lackenby	849
BTS	*b.* Carperby	816
BTT	*b.* Barlby	808
BTU	*b.* Alfred Calvert	803
BTW	*b.* Johnstown ..	846
BTX	*b.* Keneh	847
BTZ	*b.* Cormorant BTZ	826
BUC	*b.* Bilbster	811
BUD	*b.* Wearwood ..	893
BUE	*b.* Cronstadt	827
BUF	*b.* Petrograd	868
BUG	*b.* Norfolk Range	863
BUH	*b.* Harlseywood	841
BUI	*b.* Scarpa	878
BUK	*b.* Halocrates ..	840
BUL	*b.* Warora	892
BUQ	*b.* Chiller	818
BUU	*b.* Seatonia	879
BUV	*b.* Toloa	887
BUW	*b.* Seabank	878
BUX	*b.* Rhode Island	874
BUY	*b.* Overdale	866
BVG	*c.* Berwick DF	631
BVH	*c.* Harwich BVH	633
BVN	*c.* Flamborough DF	632
BVQ	*c.* Perim	617
BVY	*c.* Lizard DF ..	633
BVZ	*c.* Carnsore DF	631
BWH	*c.* Harwich BWH	633
BWK	*c.* Kingstown ..	633
BWP	*c.* Ponta Delgada	569
BWQ	*c.* Queenstown	635
BWW	*c.* Gibraltar, North Front ..	599
BXF	*c.* Famagusta	586
BXH	*c.* Orfordness D.F.	634
BXH	*c.* St. Helena ..	623
BXW	*c.* Singapore (Seletar)	609
BXY	*c.* Stonecutters Island	602
BYA	*c.* Admiralty ..	631
BYB	*c.* Cleethorpes..	631
BYC	*c.* Horsea	633
BYD	*c.* Aberdeen	630
BYE	*c.* Ipswich	633
BYF	*c.* Pembroke	634
BYH	*c.* Rosyth	635
BYJ	*c.* Felixstowe ..	632
BYK	*c.* Sheerness	635
BYL	*c.* Dover	632
BYM	*c.* Culver Cliff	632
BYN	*c.* Portland Bill	634
BYO	*c.* Rame Head	635
BYP	*c.* Cromarty	631
BYQ	*c.* Corkbeg	631
BYR	*c.* Bunbeg	631
BYS	*c.* Portpatrick	634
BYV	*c.* Grimsby Radio	633
BYW	*c.* Gibraltar, Rock	599

		PAGE
BYX	*c.* Gibraltar, Windmill Hill ..	599
BYY	*c.* Malta, S. Angelo	609
BYZ	*c.* Malta, Rinella Bay	609
BZA	*c.* Inchkeith ..	633
BZB	*c.* Bermuda ..	571
BZC	*c.* Portsmouth Signal School ..	634
BZE	*c.* Matara, Ceylon	581
BZF	*c.* Aden Radio BZF	558
BZG	*c.* Mauritius ..	610
BZH	*c.* Seychelles ..	625
BZI	*c.* Durban (Jacobs)	626
BZJ	*c.* Port Nolloth	626
BZK	*c.* Bathurst	597
BZL	*c.* Demerara	575
BZM	*c.* St. Johns	581
BZN	*c.* Falkland Islands	590
BZQ	*c.* Christiana, Jamaica	677
BZR	*c.* Somerset Island	571
BZS	*c.* Kingsnorth	633
BZT	*c.* Tynemouth	635
BZU	*c.* Immingham	633
C	*c.* Camaguey ..	585
CB	*c.* Cuabo	618
CO	*c.* Cayo Cristo	585
CW	*c.* Munich	598
CAA	*b.* Latorre CAA	674
CAD	*b.* Prat	674
CAE	*b.* O'Higgins ..	674
CAF	*b.* Esmeralda ..	673
CAG	*b.* Chacabuco ..	673
CAH	*b.* Blanco	673
CAI	*b.* Zenteno	674
CAJ	*b.* Errazuriz	673
CAK	*b.* Baquedano	673
CAL	*b.* Rancagua ..	674
CAM	*b.* Maipo CAM	674
CAN	*b.* Angamos	673
CAO	*b.* Lautaro	674
CAU	*b.* H.1.	673
CAV	*b.* H. 2 CAV ..	673
CAW	*b.* H. 3 CAW ...	674
CAX	*b.* H. 4 CAX ..	674
CAY	*b.* H. 5 CAY ..	674
CAZ	*b.* H. 6 CAZ ..	674
CBA	*b.* Lynch	674
CBB	*b.* Condell	673
CBC	*b.* Williams CBC	674
CBD	*b.* Riveros	674
CBE	*b.* Uribe	674
CBL	*b.* Thompson CBL	674
CBM	*b.* M. Jarpa	674
CBN	*b.* O'Brien CBN	674
CBO	*b.* Serrano	674
CBP	*b.* Riquelme	674
CBQ	*b.* Orella	674
CBR	*b.* M. Gamero	674
CBU	*b.* Aguila CBU	673
CBV	*b.* Leucoton	674
CBW	*b.* Colocolo	673
CBX	*b.* Elicura	673
CBY	*b.* Orompello CBY	674
CBZ	*b.* P. Sibbald	674
CCA	*c.* Arica	582
CCB	*c.* Antofagasta	582
CCC	*c.* Coquimbo ...	582
CCD	*c.* Juan Fernandez	582
CCE	*c.* Valparaiso P. Anch.	582

		PAGE
CCG	*c.* Santiago Moneda ..	582
CCH	*c.* Santiago Univers ..	582
CCI	*c.* Santiago Espejo ..	582
CCK	*c.* Talcahuano Rocuant	582
CCL	*c.* Talcahuano Esc. Torp	582
CCN	*c.* Mocha, Chile ..	582
CCO	*c.* Llanquihue ..	582
CCQ	*c.* Huafo	582
CCR	*c.* Rio Aysen	582
CCS	*c.* Raper	582
CCV	*c.* Bories	582
CCW	*c.* Punta Arenas Catalina	582
CCX	*c.* Punta Arenas Apost.	582
CCY	*c.* Evanjelistas ..	582
CCZ	*c.* Felix, Chile ..	582
CDA	*b.* Renaico	674
CDB	*b.* Aysen	673
CDC	*b.* Huasco	674
CDD	*b.* Palena	674
CDE	*b.* Imperial	674
CDF	*b.* Cachapoal	673
CDG	*b.* Mapocho	674
CDH	*b.* Maipo CDH ..	674
CDJ	*b.* Caupolican ..	673
CDK	*b.* Pisagua	674
CDL	*b.* Orompello CDL ..	674
CDM	*b.* Lautaro CDM ..	674
CDN	*b.* Itata	674
CDO	*b.* Quito CDO ..	674
CDP	*b.* Chiloe	673
CDQ	*b.* Magallanes ..	674
CDR	*b.* Taltal	674
CDS	*b.* Iquique	674
CDT	*b.* Florencia	673
CDU	*b.* Arauco	673
CDV	*b.* Calera	673
CDW	*b.* America CDW ..	673
CFA	*b.* **Bayfield**	668
CFB	*b.* **Cartier**	670
CFC	*b.* **Laurentian** ..	671
CFL	*b.* **Arleux**	668
CFM	*b.* **Armentieres** ..	668
CFN	*b.* **Givenchy**	670
CFO	*b.* **Arras**	668
CFP	*b.* **Thiepval**	673
CFQ	*b.* Loos CFQ ..	671
CGA	*b.* **Australrange** ..	658
CGB	*b.* **Australplain** ..	658
CGC	*b.* **Australbush** ..	658
CGC	*b.* S. George	660
CGD	*b.* **Australglen** ..	658
CGE	*b.* **Australford** ..	658
CGF	*b.* **Australdale** ..	658
CGF	*b.* **Eurelia**	659
CGG	*b.* **Australstream** ..	658
CGG	*b.* Eudunda	659
CGH	*b.* **Booral**	658
CGI	*b.* Bellata	658
CGK	*b.* **Dredge No. 3** ..	659
CGL	*b.* **Toromeo**	660
CGM	*b.* **Cooee**	659
CGN	*b.* **Australbrook** ..	658
CGP	*b.* **Sumatra** CGP ..	660
CGQ	*b.* **Kurumba**	659
CGR	*b.* **Winfield**	661
CGS	*b.* **Cycle**	659
CGS	*b.* Kowarra	659
CGT	*b.* **Melusia**	660
CGU	*b.* **Changsha**	659
CGV	*b.* Wyola	661
CGW	*b.* Birriwa	658
CGX	*b.* **Macedon**	659
CGY	*b.* **Taiyuan**	660
CGZ	*b.* **Apolda**	657
CHN	*b.* Vologda CHN ..	891
CHO	*b.* **Laketon**	671
CHP	*b.* **Wethersfield** ..	673
CHQ	*b.* **Lingan**	671
CHR	*b.* **Hochelaga** CHR ..	671
CHU	*b.* Modjeska	671
CHV	*b.* **Turret Cape** ..	673
CHW	*b.* **Reginolite**	672
CHX	*b.* J. A. McKee ..	671
CHY	*b.* Thomas Drummond	673
CHZ	*b.* **Turret Court** ..	673
CJC	*b.* Tug Lorne ..	673
CJE	*b.* **A. E. McKinstry** ..	668
CJG	*b.* **Empress of Japan** ..	670
CJH	*b.* **Empress of Russia**	670
CJI	*b.* **Empress of Asia** ..	670
CJJ	*b.* **Guiana**	670
CJK	*b.* **Talaralite**	673
CJL	*b.* **Glenmavis** ..	670
CJN	*b.* **Impoco**	671
CJO	*b.* Blossom Heath ..	668
CJP	*b.* **Korona**	671
CJQ	*b.* **Lord Dufferin** ..	671
CJS	*b.* Pinta	672
CJV	*b.* **Monteagle**	671
CJW	*b.* **Newona**	672
CJX	*b.* **Parima**	672
CJY	*b.* **Renvoyle**	672
CKB	*b.* **Glenisle**	670
CKD	*b.* **Canora**	669
CKE	*b.* **E. B. Osler** ..	670
CKF	*b.* **Emperor**	670
CKG	*b.* **J. H. G. Haggarty**	671
CKH	*b.* Martian	671
CKI	*b.* **Midland King** ..	671
CKJ	*b.* **Midland Prince** ..	671
CKK	*b.* **W. D. Matthews** ..	673
CKL	*b.* W. Grant Morden ..	673
CKO	*c.* Baker's Point, Nova Scotia	577
CKP	*b.* **Collingwood** CKP ..	670
CKR	*b.* Festubert	670
CKS	*b.* **Canadian Voyageur**	669
CKT	*b.* **Canadian Pioneer** ..	669
CKU	*b.* **Watuka**	673
CKV	*b.* Messines	671
CKW	*b.* Ypres	673
CKX	*b.* Vimy	673
CKY	*b.* S. Eloi CKY ..	673
CKZ	*b.* S. Julien	673
CLA	*b.* Torpedero No. 15 ..	790
CLB	*b.* Torpedero No. 16 ..	790
CLC	*b.* Torpedero No. 17 ..	790
CLD	*b.* Delfin CLD ..	784
CLE	*b.* Dorado	784
CLF	*b.* Gaviota CLF ..	785
CLG	*b.* Torpedero No. 18 ..	790
CLH	*b.* Torpedero No. 19 ..	790
CLI	*b.* Torpedero No. 20 ..	790
CLJ	*b.* Torpedero No. 21 ..	790
CLK	*b.* Torpedero No. 22 ..	790
CLL	*b.* Torpedero No. 23 ..	790

		PAGE
CXE	*b.* Manuel Opaliw	787
CXF	*b.* Mar del Norte	787
CXG	*b.* Ogono	788
CXH	*b.* Mar Mediterraneo	787
CXI	*b.* Ibai Luze	785
CXI	*b.* Iturri-Luze	786
CXJ	*b.* Leonora	787
CXK	*b.* Ibai Aurre	785
CXK	*b.* Iturri-Aurre	786
CXL	*b.* Ollargan	788
CXM	*b.* Cabo Menor	783
CXN	*b.* Onton	788
CXO	*b.* Otayo	788
CXP	*b.* Manuela Pla	787
CXQ	*b.* Oquendo	788
CXR	*b.* Mar Cantabrico	787
CXS	*b.* Cabo Carooeira	783
CXT	*b.* Teresa Fabregas	789
CXU	*b.* Artigan Mendi	782
CXV	*b.* Villaodrid	791
CXW	*b.* Marques de Campo	787
CXX	*b.* S. Mamés	789
CXY	*b.* Yandiola	791
CXZ	*b.* Guipuzcoa	785
DA	*c.* Darmstadt	597
DK	*c.* Berlin Wolff	597
DM	*c.* Berlin	597
DR	*c.* Dortmund	597
DAA	*b.* Aamot	707
DAB	*b.* Abessinia	707
DAC	*b.* Achilles DAC	707
DAE	*b.* Alexandria	707
DAF	*b.* Seelowe	710
DAI	*b.* Annie-Hugo Stinnes VI	707
DAN	*b.* Argentina	707
DAO	*b.* Arfeld	707
DAP	*b.* Aleppo DAP	707
DAQ	*b.* Gonzenheim	708
DAR	*b.* Adler	707
DAS	*b.* Albatros DAS	707
DAT	*b.* Arbeit	707
DBA	*b.* Brilliant	708
DBE	*b.* Berta	708
DBG	*b.* Deutschfeld	708
DBK	*b.* Frauenfels	708
DBN	*b.* Barenfels	708
DBP	*b.* Sturmfels	711
DBQ	*b.* Lauterfels	709
DBV	*b.* Bremerhaven	708
DBW	*b.* Amassia	707
DBX	*b.* Adalia	707
DCA	*b.* Cairo DCA	708
DCN	*b.* Crongshagen	708
DCO	*b.* Carbo II	708
DCX	*b.* Ceuta	708
DDD	*b.* Sonnenberg	710
DDG	*b.* Titan DDG	711
DDU	*b.* Deutschland	708
DEL	*b.* Ella	708
DER	*b.* Erato	708
DET	*b.* Edmund H. Stinnes	708
DEY	*b.* Bubendey	708
DFE	*b.* Fehmarn	708
DFI	*b.* Friesland DFI	708
DFK	*b.* Marie Horn	709
DFP	*b.* Gretchen Müller	709
DFU	*b.* Friedrich Franz IV	708
DFV	*b.* Mecklenburg DFV	709

		PAGE
DGE	*b.* Grossherzogin Elisabeth	709
DGF	*b.* Gotenhof	708
DGI	*b.* Grille	709
DGM	*b.* Grimm	709
DGN	*b.* Groden	709
DGR	*b.* Grüssgott	709
DGS	*b.* Targis	711
DHB	*b.* Helene Blumenfeld	709
DHE	*b.* Herkules	709
DHD	*b.* Harald DHD	709
DHI	*b.* Hindenburg	709
DHL	*b.* Hela	709
DHM	*b.* Hamburg DHM	709
DHQ	*b.* Hertha	709
DHS	*b.* Hans	709
DHU	*b.* Harburg	709
DHV	*b.* Hannover DHV	709
DHY	*b.* Habsburg	709
DHZ	*b.* Herzogin Cäcilie	709
DJT	*b.* Atle Jarl	707
DJY	*b.* Eisbrecher Berlin	708
DJZ	*b.* Eisbrecher Pommer	708
DKQ	*b.* Kaiser DKQ	709
DKV	*b.* Ditmar Koel	708
DKW	*b.* Kiew	709
DLA	*b.* Lisboa DLA	709
DLD	*b.* Ludendorff	709
DLM	*b.* Ralum	710
DMU	*b.* Murla	709
DMW	*b.* Möwe	709
DND	*b.* Niederwald	709
DNJ	*b.* Najade	709
DNX	*b.* Nixe	709
DNY	*b.* Nymphe	709
DOA	*b.* Orla DOA	710
DOC	*b.* Oberburgermeister Haken	709
DOD	*b.* Orlando	710
DOE	*b.* Ostsee	710
DOJ	*b.* Condor DOJ	708
DON	*b.* Odin DON	710
DOQ	*b.* Odin DOQ	710
DPC	*b.* Preussen DPC	710
DPD	*b.* Prinzessin Heinrich	710
DPI	*b.* Prinz Eitel Friedrich	710
DPO	*b.* Pommern	710
DPP	*b.* Prinzessin Sophie Charlotte	710
DPY	*b.* Poseidon	710
DQA	*b.* Wangerooge	711
DRB	*b.* Roland	710
DRG	*b.* Reiherstieg	710
DSA	*b.* Salvator DSA	710
DSB	*b.* Strassburg	710
DSC	*b.* Schelde	710
DSD	*b.* Seeadler DSD	710
DSE	*b.* Seeadler	710
DSH	*b.* Seehund	710
DSN	*b.* Schwan	710
DSO	*b.* Soneck	710
DSR	*b.* Sophie Rickmers	710
DSS	*b.* Seestern	710
DSW	*b.* Sachsenwald	710
DTA	*b.* Adolf Sommerfeld	675
DTB	*b.* Baltic DTB	675
DTC	*b.* Artus	675
DTD	*b.* Danzig	676
DTF	*b.* Flora Sommerfeld	676

		PAGE
DTG	*b.* Gedania	676
DTV	*b.* Vistula	676
DTZ	*b.* Zoppot	676
DUJ	*b.* Urundi	711
DUO	*b.* Usaramo	711
DVB	*b.* Bagdad DVB ..	708
DVL	*b.* Villareal DVL ..	711
DVP	*b.* Kypros	709
DVS	*b.* Vorwärts	711
DWB	*b.* Wartburg	711
DWI	*b.* Wilhelm	711
DWJ	*b.* Wajac	711
DWP	*b.* Winfried DWP ..	711
DWW	*b.* Martha Woermann	709
DWX	*b.* Lili Woermann ..	709
DXD	*b.* Adana	707
DXF	*b.* Horncap	709
DXK	*b.* Henry Lutgens ..	709
DXN	*b.* Cette	708
DXQ	*b.* Pontus	710
DXR	*b.* Hercules	709
DXS	*b.* Tamara II	711
DXW	*b.* Este	708
DYN	*b.* Altmark	707
DZE	*b.* Zeus..	711
DZX	*b.* Fritz Stauss ..	708
EAA	*c.* Aranjuez	626
EAB	*c.* Barcelona EAB ..	626
EAC	*c.* Cádiz EAC	626
EAF	*c.* Cabo Finisterre ..	626
EAL	*c.* Las Palmas	581
EAO	*c.* Soller	627
EAP	*c.* Cabo de Palos ..	626
EAS	*c.* Cabo Mayor ..	626
EAT	*c.* Teneriffe	581
EAV	*c.* Vigo	627
EAY	*c.* S. Isabel de Fernando Pó ..	591
EBA	*b.* Espana	785
EBB	*b* Alfonso XIII. EBB	782
EBC	*b* Jaime I	786
EBD	*b.* Pelayo	788
EBE	*b.* Carlos V	783
EBE	*b.* Emperador Carlos V.	784
EBF	*b.* Cataluña EBF ..	783
EBG	*b.* Princesa d'Asturias	788
EBH	*b.* Reina Regente ..	789
EBI	*b.* Giralda	785
EBJ	*b.* Estremadura EBJ ..	785
EBK	*b.* Rio de la Plata EBK	789
EBL	*b.* Infanta Isabel EBL	785
EBM	*b.* Alvaro de Bazán ..	782
EBN	*b.* Almirante Lobo ..	782
EBO	*b.* Bustamante ..	783
EBP	*b.* Villaamiel	791
EBQ	*b.* Cardarso	783
EBR	*b.* Bonifaz	783
EBS	*b.* Lauria	786
EBT	*b.* Laya	786
EBU	*b.* Recalde	789
EBV	*b.* Nautilus	788
EBW	*c.* Le Ferrol	627
EBX	*c.* Cartagena	627
EBY	*c.* S. Fernando Cádiz	627
EBZ	*c.* Madrid EBZ ..	627
ECA	*b.* Balmes	783
ECB	*b.* Barcelona	783
ECC	*b.* Cádiz	783
ECD	*b.* Angel B. Perez ..	782
ECE	*b.* Emilia S. de Perez	784
ECF	*b.* Carolina E. de Perez	783
ECG	*b.* Arriluze	782
ECH	*b.* Mar Rojo	787
ECI	*b.* Ines ECI	785
ECJ	*b.* Jaime Girona ..	786
ECJ	*b.* Jaime Jerona ...	786
ECK	*b.* Cabo tres Forcas ..	783
ECL	*b.* P. Claris	788
ECM	*b.* Mar Tirreno ..	787
ECN	*b.* Marques de Urguijo	787
ECO	*c.* Conakry	596
ECO	*b.* Mouro	788
ECP	*b.* Miguel M. Pinillos	787
ECR	*b.* Teresa Taya ..	790
ECS	*b.* Rosario ECS ..	789
ECT	*b.* Catalina	784
ECU	*b.* Cabo Cervera ..	783
ECV	*b.* Mar Negro ..	787
ECW	*b.* Conde Wifredo ..	784
ECX	*b.* Galdames	785
ECY	*b.* Infanta Isabel ECY	785
ECZ	*b.* Martin Saenz ..	787
EDA	*b.* Alicante	782
EDB	*b.* Buenos Aires EDB	783
EDC	*b.* Cataluna EDC ..	784
EDD	*b.* Alfonso XII ..	781
EDE	*b.* Yute	791
EDF	*b.* Adelina	781
EDG	*b.* Legazpi	786
EDH	*b.* C. Lopez y Lopez ..	784
EDI	*b.* Infanta Isabel de Borbon .	785
EDJ	*b.* Santa Isabel ..	789
EDK	*b.* Reina Maria Cristina	789
EDL	*b.* Antonio Lopez ..	782
EDM	*b.* Manuel Calvo ..	787
EDN	*b.* Montserrat ..	788
EDO	*b* Leon XIII ..	786
EDP	*b.* Isla Depanay ..	786
EDQ	*b.* San Carlos ..	789
EDR	*b.* Florinda	785
EDS	*b.* P. Satrustegui ..	789
EDT	*b.* Alfonso XIII EDT	782
EDU	*b.* Reina Victoria .. Eugenia ..	789
EDV	*b.* Montevideo EDV	788
EDW	*b.* M. L. Villaverde ..	787
EDX	*b.* Juliana	786
EDY	*b.* Navarra EDY ..	788
EDZ	*b.* Ciudad de Cadiz ..	784
EEA	*b.* Auxias March ..	783
EEB	*b.* Barcelo	783
EEC	*b.* Cabañal	783
EED	*b.* Andalucia	782
EEE	*b.* Torras y Bages ..	790
EEF	*b.* Vicente Ferrer ..	791
EEG	*b.* Grao	785
EEH	*b.* J. B. Llevera ..	786
EEI	*b.* Jatiba	786
EEJ	*b.* Jorge Juan.. ..	786
EEK	*b.* Canalejas	783
EEL	*b.* A. Lazaro	781
EEM	*b.* Aragon	782
EEN	*b.* General Fernandez Silvestre ..	785
EEO	*b.* Sagunto	789
EEP	*b.* V. Puchol	791

		PAGE
EEQ	*b.* Castilla	783
EER	*b.* Vicente La Roda ..	791
EES	*b.* J. S. Sister ..	786
EET	*b.* Teodoro Llorente	789
EEU	*b.* Cataluna EEU ..	784
EEV	*b.* Jacinto Verdaguer	786
EEV	*b.* J. Verdaguer ..	786
EEW	*b.* Villarreal EEW ..	791
EEX	*b.* Navarra EEX ..	788
EEY	*b.* Adolfo	781
EEZ	*b.* Tambre	789
EFA	*b.* Atlante EFA ..	783
EFB	*b.* Beliver	783
EFC	*b.* Cataluña EFC ..	783
EFD	*b.* Delfin EFD ..	784
EFE	*b.* Teresa Pamies ..	790
EFF	*b.* Salvador EFF ..	789
EFG	*b.* Mar Caspio ..	787
EFH	*b.* Hesperides ..	785
EFI	*b.* Isleno	786
EFJ	*b* Rey Jaime I ..	789
EFK	*b.* Mallorca	787
EFL	*b.* Lulio	787
EFM	*b.* Tangoreño	789
EFN	*b.* Mahon	787
EFO	*b.* Isla de Menorca ..	786
EFP	*b.* Torre Blanca ..	790
EFQ	*b.* Menorquin	787
EFR	*b.* Balear	783
EFS	*b.* Rey Jaime II ..	789
EFT	*b.* Monte Toro ..	788
EFU	*b.* Turia	791
EFV	*b.* Reina Victoria ..	789
EFW	*b.* Villa Garci	791
EFX	*b.* Tirso EFX	790
EFY	*b.* Fuerteventura ..	785
EFZ	*b.* Jaume d'Urgell ..	786
EGA	*c.* Almeria	626
EGB	*c.* Melilla	611
EGC	*c.* Madrid EGC ..	627
EGD	*c.* Ceuta	611
EGE	*c.* Barcelona EGE ..	626
EGF	*c.* Larache	611
EGG	*c.* Valencia	627
EGH	*c.* Bilbao	626
EGI	*c.* Mahon	627
EGJ	*c.* Coruña	627
EGK	*c.* Tetuan	611
EGM	*c.* Malaga	627
EGZ	*c.* Guadalajara ..	627
EHA	*b.* Torpedero No. 1 ..	790
EHB	*b.* Torpedero No. 2 ..	790
EHC	*b.* Torpedero No. 3 ..	790
EHD	*b.* Torpedero No. 4 ..	790
EHE	*b.* Torpedero No. 5 ..	790
EHF	*b.* Torpedero No. 6 ..	790
EHG	*b.* Torpedero No. 7 ..	790
EHH	*b.* Torpedero No. 8 ..	790
EHI	*b.* Torpedero No. 9 ..	790
EHJ	*b.* Torpedero No. 10 ..	790
EHK	*b.* Torpedero No. 11 ..	790
EHL	*b.* Torpedero No. 12 ..	790
EHM	*b.* Torpedero No. 13 ..	790
EHN	*b.* Torpedero No. 14 ..	790
EHO	*b.* Osado	788
EHP	*b.* Isaac Peral ..	786
EHQ	*b.* Audaz	783
EHR	*b.* Proserpina	788
EHS	*b.* Terror	790
EHT	*b.* Hernan Cortes ..	785
EHU	*b.* Marques de Molins	787
EHV	*b.* Marques de la Victoria ..	787
EHW	*b.* Marie de Molina ..	787
EHX	*b.* Submarino A.1 ..	789
EHY	*b.* Submarino A.2 ..	789
EHZ	*b.* Submarino A.3 ..	789
EIA	*b.* Ryckett	877
EIE	*b.* Hampstead Heath	841
EIF	*b.* Discoverer ..	829
EIG	*b.* Merchant	858
EIH	*b.* Navigator	862
EII	*b.* City of Smyrna ..	820
EIJ	*b.* Crewe Hall ..	827
EIK	*b.* Crosby Hall ..	827
EIO	*b.* Warkworth	892
EIP	*b.* Port Hacking ..	871
EIR	*b.* Clan Morrison ..	823
EIS	*b.* Clan Monroe ..	823
EIT	*b.* Clan Ranald ..	823
EIU	*b.* Inverness	845
EJB	*b.* Woodcock	894
EJC	*b.* Polish Monarch ..	869
EJD	*b.* Benavon	810
EJE	*b.* Queensland	873
EJF	*b.* Aguila	802
EJH	*b.* Roxmead	876
EJI	*b.* Dundrennan ..	830
EJJ	*b.* Hyanthes	844
EJN	*b.* Mercedes de Larrinaga	858
EJQ	*b.* Glasgow	837
EJR	*b.* Anselma de Larrinaga	804
EJT	*b.* Navasota	861
EJV	*b.* Sudbury	882
EJW	*b.* Port Chalmers ..	870
EJY	*b.* Volute	891
EJZ	*b.* Collingham ..	824
EKA	*b.* Silversand	880
EKC	*b.* Benrinnes	811
EKD	*b.* Spilsby	881
EKF	*b.* Carisbrook	816
EKG	*b.* Yorkmead	895
EKH	*b.* Southport	881
EKI	*b.* Wearbridge ..	893
EKM	*b.* Mahronda	853
EKN	*b.* Portloe	871
EKO	*b.* Marlwood	856
EKR	*b.* Salient	877
EKT	*b.* Warfield	892
EKV	*b.* Cliftonhall	825
EKW	*b.* Manchester Brigade	854
EKY	*b.* Kurmark	849
ELA	*b.* Gloria de Larrinaga	838
ELF	*b.* Iddesleigh	844
ELH	*b.* Garryvale	836
ELI	*b.* Concordia	825
ELL	*b.* Ancula	804
ELM	*b.* Novington	864
ELN	*b.* Queen Alexandra ..	872
ELQ	*b.* Dungeness ..	830
ELR	*b.* Tregurno	887
ELS	*b.* Langton Hall ..	850
ELT	*b.* Severnmede ..	879
ELU	*b.* Flixton	835
ELV	*b.* Burnholme ..	815
ELW	*b.* Saxilby	878

		PAGE
ELY	b. Graziella ELY ..	839
ELZ	b. Manchester Division	855
EMA	b. Marie de Larrinaga	856
EMB	b. Asuncion de Larrinaga	807
EMC	b. Esperanza de Larrinaga	833
EMF	b. Victoria de Larrinaga	890
EMG	b. Asturian	807
EMH	b. Austrian	807
EMJ	b. Lucigen	852
EMK	b. Falernian	834
EML	b. Malatian	854
EMM	b. City of Shanghai ..	820
EMN	b. Maronian	856
EMQ	b. Montenegro EMQ	860
EMS	b. Professor EMS ..	872
EMT	b. Thessaly	886
EMV	b. Wye Crag	895
EMZ	b. Tantah	885
ENA	b. Vasconia	890
ENC	b. Rocio	875
END	b. Hermione END ..	842
ENE	b. Governor	839
ENF	b. Bankdale	808
ENG	b. Graig	839
ENH	b. Lompoc	851
ENI	b. Kent	848
ENJ	b. Maid of Orleans ..	853
ENK	b. Westmead ENK ..	893
ENL	b. Wairuna	891
ENM	b. Trincuto	888
ENN	b. Andrée	804
ENP	b. Llanthony Abbey ..	851
ENQ	b. Nowshera ..	864
ENR	b. Gleneden	837
ENS	b. Benalder	810
ENT	b. Levenpool	851
ENV	b. Glensanda	837
ENW	b. Logician	851
ENX	b. Fenchurch ..	834
EOB	b. Clematis	824
EOC	b. Tafna EOC ..	884
EOE	b. City of Baroda ..	819
EOG	b. Nevisian	862
EOJ	b. Sitra	880
EOL	b. Arabier	805
EON	b. Cimbrier	818
EOO	b. Exmouth	833
EOP	b. Maindy Abbey ..	853
EOQ	b. Neko	862
EOR	b. Stanley Hall ..	881
EOS	b. David Lloyd George	828
EOT	b. Baron Kelvin ..	809
EOU	b. Inveresk	845
EOV	b. Mesaba	859
EOW	b. Hellenes	841
EOX	b. Hostilius	843
EOZ	b. Needwood	862
EPA	b. E. O. Saltmarsh ..	832
EPB	b. Maindy Manor ..	854
EPC	b. Maindy Court ..	854
EPD	b. Flying Breeze ..	834
EPE	b. Rothley	876
EPF	b. Grelstone	839
EPG	b. Kirkwood	848
EPH	b. Jolly Inez	846
EPJ	b. Ouwen	865
EPJ	b. Rumney	877
EPK	b. British Vine ..	814
EPL	b. Somerset	881
EPM	b. Senator	879
EPN	b. Port Augusta ..	870
EPO	b. Port Philip ..	871
EPQ	b. Benvenue ..	811
EPU	b. Statesman ..	882
EPW	b. Avonmede	807
EPY	b. Inveric	845
EPZ	b. Gymeric	840
EQB	b. Port Alma	870
EQC	b. British Rose ..	814
EQD	b. Port Victor ..	871
EQE	b. Cape Breton ..	815
EQF	b. Prygona	872
EQH	b. Wigmore	893
EQI	b. Clan Kennedy ..	821
EQJ	b. Trostan	888
EQK	b. Gwladys	840
EQL	b. Queenmead ..	873
EQN	b. Sampan	877
EQO	b. Baysarua	810
EQP	b. Megna	858
EQQ	b. Staveley	882
EQR	b. Glenstrae	838
EQV	b. Rapidan	873
EQY	b. Rotenfels	876
ERB	b. Leeds City	850
ERC	b. York Castle ..	815
ERE	b. Corfe Castle ..	826
ERF	b. Umzinto	889
ERG	b. Susquehanna ..	882
ERH	b. Epsom	832
ERI	b. Umtali	889
ERK	b. Tusculum	888
ERL	b. Assiout	806
ERM	b. Trophon	888
ERR	b. Withington.. ..	894
ERS	b. Scottish Monarch ..	878
ERU	b. Wearpool	893
ERV	b. Framlington Court	835
ERW	b. Prah	871
ERY	b. Vancouver	889
ERZ	b. Erroll	833
ESA	b. Makalla	854
ESC	b. Malayan	659
ESC	b. Malayan	854
ESD	b. Devon City ..	829
ESE	b. Brodsworth ..	814
ESF	b. Chalister	817
ESH	b. Gambia	836
ESK	b. Ashanti	806
ESO	b. Sicily	879
ESP	b. Baytigern	810
ESQ	b. Kalimba	847
ESR	b. Janeta	845
ESS	b. Brescia ESS ..	813
EST	b. Phrygia	869
ESV	b. Wye Valley ..	895
ESW	b. Roma ESW ...	875
ESY	b. Bellerby	810
ESZ	b. Diyatalawa.. ..	829
ETB	b. Director	829
ETC	b. Oak Branch ..	864
ETF	b. Lamington	849
ETG	b. Hortensius	843
ETJ	b. Skipton Castle ..	880
ETL	b. Troutpool	888

		PAGE
ETM	*b.* Stagpool	881
ETP	*b.* County of Cardigan	826
ETQ	*b.* North Britain	863
ETS	*b.* Freshwater	835
ETT	*b.* Camerata	815
ETU	*b.* Baydouglas	809
ETV	*b.* Manchurian Prince	855
ETY	*b.* Bradburn	813
ETZ	*b.* Petersham	868
EUA	*b.* Antigone EUA	804
EUB	*b.* Rees Llewellyn	874
EUE	*b.* Headcliffe	841
EUH	*b.* Zero	895
EUM	*b.* Brabandier	813
EUN	*b.* Geddington Court	836
EUQ	*b.* Apsley	805
EUR	*b.* Salerno	877
EUS	*b.* Ariadne Irene	806
EUU	*b.* Pruth	872
EUW	*b.* Queen Louise	873
EUZ	*b.* Zermatt	895
EVA	*b.* Mesopotamia	859
EVB	*b.* Springburn	881
EVC	*b.* Rabymere	873
EVD	*b.* River Orontes	875
EVF	*b.* Umzumbi	889
EVG	*b.* Willesden	893
EVH	*b.* Brynmead	814
EVJ	*b.* Corwen	826
EVK	*b.* Cranmore	827
EVL	*b.* Hartfield	841
EVN	*b.* Valemead	889
EVP	*b.* Willcasino	893
EVU	*b.* Stanmore	881
EVV	*b.* Euplectela	833
EVW	*b.* Physa	869
EVY	*b.* Atholl	807
EVZ	*b.* S. Stephen	884
EWC	*b.* Perth	868
EWD	*b.* Cape Corso	815
EWE	*b.* Wimborne	893
EWF	*b.* Clarissa Radcliffe	824
EWG	*b.* Palm Branch	866
EWH	*b.* Datchet	828
EWN	*b.* Tabarka	884
EWR	*b.* Pengreep	867
EWS	*b.* Twickenham	888
EWU	*b.* Beckenham	810
EWW	*b.* Blackheath	811
EWZ	*b.* Cairngowan	815
EXB	*b.* Norwich City	864
EXC	*b.* Harperley	841
EXE	*b.* Maymead	857
EXF	*b.* Llangorse	851
EXG	*b.* Duneric	830
EXI	*b.* Scaldier	878
EXJ	*b.* Sorrento	881
EXK	*b.* Reading	873
EXN	*b.* Auguste Halenke	807
EXO	*b.* Albany EXO	803
EXP	*b.* Bretanier	813
EXR	*b.* Ocean Monarch	864
EXS	*b.* Copenhagen	825
EXT	*b.* Corstar	826
EXU	*b.* Skegness	880
EXW	*b.* Cardiff	816
EXX	*b.* Broadmayne	814
EXY	*b.* Penrhydd	868
EYA	*b.* Briarleaf	813
EYB	*b.* British Maple	813
EYC	*b.* Laurelleaf	850
EYD	*b.* British Birch	813
EYE	*b.* Tuscarora	888
EYF	*b.* Cadillac	815
EYG	*b.* Saranac	877
EYH	*b.* Spermina	881
EYI	*b.* Vennonia	890
EYJ	*b.* Tiara	886
EYK	*b.* Candidate	815
EYL	*b.* Centurion	817
EYM	*b.* British Peer	814
EYN	*b.* British Knight	813
EYO	*b.* Coq EYO (Le)	850
EYP	*b.* Luciline	852
EYQ	*b.* Lutetian	852
EYR	*b.* Horden	843
EYS	*b.* British Earl	813
EYU	*b.* British Baron	813
EYV	*b.* Cape Colony	815
EYW	*b.* British Marquis	814
EYX	*b.* Tynemouth	889
EYY	*b.* British Duke	813
EYZ	*b.* Magician	853
EZA	*b.* Dunclutha	830
EZE	*b.* British Fern	813
EZF	*b.* Elmleaf	832
EZG	*b.* Beechleaf	810
EZH	*b.* Pyrula	872
EZJ	*b.* British Holly	813
EZK	*b.* Dockleaf	829
EZL	*b.* Snaefell	880
EZM	*b.* Lindenhall	851
EZN	*b.* Biarritz	811
EZO	*b.* Mount Snowdon	860
EZQ	*b.* Regent	874
EZR	*b.* Aberlour	801
EZS	*b.* Lady Astley	849
EZT	*b.* Hampstead	840
EZW	*b.* Whateley Hall	893
EZX	*b.* Barmoor	808
EZY	*b.* Eaton Hall	831
F4	*c.* Frankfort-on-Oder	598
FD	*c.* Friedrichshafen	598
FL	*c.* Eiffel Tower, Paris	592
FM	*c.* Frankfort-on-Maine	598
FAA	*b.* Erdre	692
FAB	*b.* S. Aygulf	703
FAC	*b.* Carmen FAC	689
FAD	*b.* Chezine	690
FAG	*b.* Grandlieu	694
FAJ	*b.* S. Tropez	704
FAK	*b.* Elisabeth Marie	692
FAO	*c.* Hanoï	594
FAP	*b.* Provence FAP	701
FAS	*b.* S. Raphaël	704
FAU	*b.* Divatte	691
FAV	*b.* Limoges	696
FAY	*b.* Yser FAY	707
FAZ	*b.* Sevre	702
FBB	*b.* Cap Fagnet	689
FBC	*b.* Normandie	699
FBD	*b.* Simon Duhamel	703
FBF	*b.* Eglantine FBF	691
FBG	*b.* Agile	683
FBG	*b.* Lavardin	696
FBH	*b.* Marne FBH	697
FBI	*b.* Jules Henry	695
FBJ	*b.* Jupiter FBJ	695

		PAGE
FBL	*b.* Baleines (Les)	685
FBM	*b.* Marguerite Marie II	697
FBN	*b.* Chassiron	689
FBO	*b.* Marguerite Marie ..	697
FBP	*b.* Mossi	699
FBQ	*b.* General Doods ..	693
FBR	*b.* Picorre	700
FBS	*b.* Ghislaine	694
FBT	*b.* Doucouëdic FBT ..	691
FBU	*b.* Uranus	706
FBV	*b.* La Sambre FBV ..	696
FBW	*b.* Harle	694
FBX	*b.* Bisson FBX ..	686
FBY	*b.* Bois des Buttes ..	686
FBZ	*b.* Damier	691
FCA	*b.* Asie FCA	684
FCA	*c.* My-Tho	595
FCA	*c.* Saigon	595
FCB	*c.* Cac-Ba	594
FCB	*b.* Bougainville ..	686
FCC	*b.* Ceylan	689
FCD	*b.* Dupleix FCD ..	691
FCE	*b.* Amiral Duperre ..	684
FCF	*b.* Amiral Fourichon ..	684
FCG	*b.* Amiral Rigault de Genouilly ..	684
FCH	*b.* Amiral Ganteaume..	684
FCI	*b.* Amiral Latouche Treville	684
FCJ	*b.* Amiral Jauréguiberry	684
FCK	*b.* Caravellas	689
FCL	*b.* Amiral Sallandrouze de Lamornaix ..	684
FCM	*b.* Malte	697
FCN	*b.* Aden	683
FCO	*c.* Conakry	552
FCP	*b.* Ango	684
FCQ	*b.* Tchad	704
FCR	*b.* Afrique FCR ..	683
FCS	*b.* Campinas FCS ..	689
FCT	*b.* Amiral Troude ..	684
FCU	*b.* Europe FCU ..	692
FCV	*b.* Amiral Villaretde Joyeuse	684
FCW	*b.* Ouessant	699
FCX	*b.* Amiral Nielly ..	684
FCY	*b.* Amiral Ponty ..	684
FCZ	*b.* Adrar	683
FDA	*c.* Dakar	596
FDB	*b.* La Coubre	690
FDC	*b.* Geubwiller	694
FDD	*b.* Monte d'Oro ..	698
FDE	*b.* Colonel Driant ..	690
FDF	*b.* France FDF ..	693
FDG	*c.* Diégo-Suarez ..	608
FDH	*b.* Rochebonne ..	701
FDL	*b.* Stella FDL ..	708
FDN	*b.* Marthe	697
FDO	*c.* Dzaoudzi	584
FDP	*b.* Phocéen	700
FDQ	*b.* Montjoie	698
FDR	*b.* Colmar	690
FDS	*b.* Shamrock FDS ..	702
FDT	*b.* Outreau	699
FDU	*b.* Saverne	702
FDZ	*b.* Craonne II	691
FEB	*c.* Bernières-Gonio ..	592
FEG	*c.* Guipavas-Gonio ..	592
FEI	*e.* Moulin du Seigneur Gonio	593
FEJ	*c.* Djidjelli-Gonio ..	563
FEM	*c.* Mitre-Gonio (La) ...	593
FEN	*c.* Griz-Nez Gonio ...	592
FEO	*c.* Ouessant-Pen-ar-Roch	593
FEP	*c.* Penmarch-Gonio ..	393
FER	*c.* Pointe du Raz-Gonio	593
FES	*c.* Soubise-Gonio ..	593
FET	*c.* Tréguier S. Gonery-Gonio	594
FEZ	*c.* S. Nazare-Chemoulin-Gonio.. ..	593
FFA	*c.* Alger T.S.F. ..	563
FFB	*c.* Boulogne-sur-Mer T.S.F.	592
FFC	*c.* Bonifacio T.S.F. ..	592
FFH	*c.* Havre T.S.F. (Le) ..	592
FFI	*c.* Dieppe	592
FFM	*c.* Marseille-Gonio ..	593
FFM	*c.* Marseille T.S.F. ..	593
FFN	*c.* Nice T.S.F. ..	593
FFS	*c.* S. Maries-de-la-Mer T.S.F.	593
FFT	*c.* Cap-Bon	630
FFU	*c.* Ouessant-Gonio ..	593
FFU	*c.* Ouessant T.S.F. ..	593
FFX	*c.* Bordeaux T.S.F. ..	592
FFY	*c.* Makatea	595
FFZ	*c.* Shanghai-Zikawei ..	583
FGA	*b.* Biskra	686
FGB	*b.* Ville de Bône ..	706
FGC	*b.* Cantal	689
FGD	*b.* Duc d'Aumale ..	691
FGE	*b* La Fayette.. ..	696
FGF	*b.* Flandre FGF ..	693
FGI	*b.* Mississippi	698
FGJ	*b.* S. Jean	703
FGK	*b.* Abd-el-Kader ..	683
FGL	*b.* Ville de Nantes ..	707
FGM	*b.* Ville de Madrid ..	706
FGN	*b.* La Nièvre	699
FGO	*c.* Loango	594
FGO	*b.* Timgad	704
FGP	*b.* Eugène Péreire ..	692
FGQ	*b.* Oudjda	699
FGR	*b.* Charles Roux ..	689
FGS	*b.* Moïse	698
FGT	*b.* Ville de Tunis ..	707
FGU	*b.* Puerto-Rico ..	701
FGV	*b.* Aube	685
FGW	*b.* Vendee	706
FGY	*b.* Maréchal Bugeaud ..	697
FGZ	*b.* Ville d'Oran FGZ ..	707
FHA	*b.* Afrique II ..	683
FHA	*c.* Brest-Guipavas ..	592
FHB	*b.* Notre Dame de Lourds	699
FHC	*b.* Charlotte	689
FHE	*b.* Emmanuella ..	692
FHF	*b.* France FHF ..	693
FHG	*b.* Gabriella	693
FHH	*b.* Henriette FHH ..	694
FHI	*b.* Asie FHI	685
FHJ	*b.* Jeannot	695
FHK	*b.* Slack	703
FHL	*b.* Edith Cavell FHL..	691
FHM	*b.* Marie Rose FHM ..	697

		PAGE
FHO	*b.* Antoinette	685
FHP	*b.* Lillois	696
FHQ	*b.* Rorqual	702
FHR	*b.* Rosemonde	702
FHS	*b.* Marie-Stella	697
FHT	*b.* Somme FHT	703
FHU	*b.* Automne	685
FHW	*b.* Wimereux	707
FHX	*b.* Patrie FHX	700
FHY	*b.* Rosita	702
FHZ	*b.* Inés FHZ	695
FIA	*b.* Titan FIA	704
FIB	*b.* Bosphore	686
FIC	*b.* Caucase	689
FID	*b.* Danube FID	691
FIE	*b.* Hercule	694
FIG	*b.* Kouang-Si	696
FIH	*b.* Ispahan	695
FIK	*b.* Docteur P. Benoit	691
FIL	*b.* Jupiter FIL	695
FIM	*b.* Imérina	695
FIN	*b.* Breton	686
FIO	*b.* Sidon	703
FIP	*b.* Jean Stern	695
FIQ	*c.* Miquelon	623
FIS	*b.* Commandant Dorise	690
FIT	*c.* Galantry	623
FIX	*b.* Dupleix FIX	691
FIY	*b.* Lieutenant Missiessy	696
FJA	*c.* Majunga	608
FJB	*b.* Providence FJB	701
FJC	*b.* Canada FJC	689
FJE	*b.* Braga	686
FJG	*b.* Britannia FJG	687
FJI	*b.* Gergovia	693
FJJ	*c.* Djibouti	596
FJM	*b.* Madonna	697
FJP	*b.* Patria FJP	700
FJR	*b.* Roma FJR	701
FJS	*b.* Syria FJS	703
FKA	*c.* Kien-An	594
FKB	*b.* Sybil	703
FKD	*b.* Bordeaux	686
FKD	*c.* Destrellan	601
FKE	*b.* Carnoules	689
FKF	*c.* Duala	594
FKF	*b.* Cavallaire	689
FKG	*b.* Guéthary	694
FKH	*b.* Homécourt	695
FKI	*b.* Irouléguy	695
FKJ	*b.* Villeneuve	707
FKK	*b.* Vence	706
FKQ	*c.* Fort de France	609
FKN	*b.* Flandre FKN	693
FKY	*b.* Hendaye	694
FLA	*b.* Ville de Havre	706
FLB	*b.* Ville de Metz	707
FLD	*b.* Conde FLD	690
FLG	*b.* Eugène Grosos	692
FLH	*b.* Havraise	694
FLI	*b.* Ville de Majunga	706
FLK	*b.* Anglet	684
FLL	*b.* Ville de Rouen	707
FLM	*b.* Ville de Reims	707
FLN	*b.* Ile de la Reunion	695
FLO	*b.* Ville d'Oran FLO	707
FLP	*b.* Ville de Paris	707
FLQ	*b.* Ville de Tamatave	707
FLR	*b.* Ville d'Arras	706
FLS	*b.* Ville de Marseille	706
FLT	*c.* Tourane	595
FLT	*c.* Mutsamuda	584
FMA	*c.* Monrovia	668
FMB	*b.* Armand Béhic	685
FMC	*b.* Chili	690
FMF	*b.* Capitaine Faure	689
FMI	*b.* Meinam	697
FMI	*c.* Moncay	595
FMK	*b.* Crimée	691
FML	*b.* Lotus	697
FMM	*b.* Normand	699
FMO	*b.* Orenoque	699
FMP	*b.* Pei Ho	700
FMQ	*b.* Commissaire Pierre Lecocq	690
FMR	*b.* Cordillère	690
FMS	*b.* Porthos	701
FMT	*b.* Atlantique	685
FMU	*b.* Basque	686
FMY	*b.* Bagdad FMY	685
FMZ	*b.* Amazone	684
FND	*b.* Dumbea	691
FNG	*b.* Andre Lebon	684
FNH	*b.* Tibet	704
FNK	*b.* Kantara (El)	696
FNL	*b.* Louqsor	697
FNM	*b.* Melbourne FNM	698
FNN	*b.* Nera	699
FNO	*b.* Océanian	699
FNP	*b.* Paul Lecat	700
FNV	*b.* Persepolis	700
FNW	*b.* Pacifique	700
FNX	*b.* Sphinx	703
FOA	*b.* S.Ambroise	703
FOB	*b.* S. Basile	703
FOC	*b.* S.Marc FOC	703
FOD	*b.* S. Firmin	703
FOF	*b.* S. François	703
FOG	*b.* S. Prosper	703
FOH	*b.* S. Thomas	704
FOH	*b.* Hâleur	694
FOI	*b.* S. Pierre	703
FOJ	*b.* S. Didier	703
FOK	*b.* S. Cyrille	703
FOL	*b.* S. Paul FOL	703
FOM	*b.* S. Michael	703
FOO	*b.* Bois des Caures	686
FOP	*c.* Wahina Papeete	595
FOQ	*b.* Bernache	686
FOS	*b.* S. Louis FOS	703
FOT	*b.* S. Mathieu	703
FOV	*b.* S. Vincent FOV	704
FOY	*b.* S. Barthélémy	703
FPA	*b.* Anatolie	684
FPB	*b.* Abda	683
FPC	*b.* Circassie	690
FPD	*b.* Doukkala	691
FPE	*c.* Port-Etienne	596
FPF	*b.* Felix Fraissinet	693
FPH	*b.* S. Maxime	703
FPI	*b.* Rebia	701
FPJ	*b.* Phrygie	700
FPK	*c.* Phu-Quoc	595
FPK	*b.* Radium	701
FPL	*b.* Jarlot	695
FPM	*b.* Sous	703
FPN	*b.* Turenne	705
FPO	*b.* Ionie	695

		PAGE
FPQ	*b.* Meurthe	698
FPR	*c.* Poulo Condore ..	595
FPR	*b.* Armenie	685
FPT	*b.* Aster FPT	685
FPU	*b.* Tensift	704
FPW	*b.* Souirah	703
FPX	*b.* Mingrelie	698
FPY	*b.* Noun	699
FPZ	*b* Draa	691
FQA	*b.* Ardèche	685
FQB	*b.* Sénégambie ..	702
FQC	*b.* Caraïbe	689
FQD	*b.* Drôme	691
FQE	*b.* Bassee-Terre ..	686
FQF	*b.* Finistère	693
FQG	*b.* Géorgie	693
FQH	*b.* La Rochelle ..	701
FQI	*b.* Titan FQI	704
FQJ	*b.* Jeanne d'Arc FQJ	695
FQK	*b.* Capitaine Coulon ..	689
FQL	*b.* Lamentin	696
FQM	*b.* Mont-Ventoux ..	699
FQN	*c.* Nouméa-Sémaphore	595
FQO	*b.* Orne	699
FQP	*b.* S. Adresse	703
FQQ	*b.* Michigan FQQ ..	698
FQR	*b.* Orégon FQR ..	699
FQS	*b.* Somme FQS ..	703
FQT	*b.* Texas FQT ..	704
FQU	*b.* Athlète FQU ..	685
FQV	*b.* Vaucluse FQV ..	706
FQW	*b.* S. André	703
FQX	*b.* Antilles	685
FQY	*b.* Guyane	694
FQZ	*b.* Taza	704
FRA	*b.* Liamone	696
FRB	*b.* Iberia	695
FRC	*b.* Corsica	690
FRE	*b.* Eole	692
FRF	*b.* S. Marc FRF ..	703
FRG	*b.* Angoulême ..	685
FRH	*b.* Henry Fraissinet ..	694
FRI	*b.* Tours FRI ..	705
FRJ	*b.* Jacques Fraissinet ..	695
FRK	*b.* Bourges	686
FRL	*b.* Apollon	685
FRN	*b.* Numidia	699
FRO	*b.* Blois	686
FRP	*b* Pelion	700
FRQ	*b.* Toulouse	705
FRR	*b.* Louis Fraissinet ..	697
FRS	*b.* Edouard Shaki ..	691
FRT	*b.* Corte II	690
FRU	*c.* Rufisque	596
FRV	*b.* Vulcain	707
FRW	*b.* Orléans FRW ..	699
FRX	*b.* Nantes	699
FRY	*b.* S. Anne	703
FRZ	*b.* S. Nazaire	703
FSA	*b.* Aurigny	685
FSD	*b.* Divonna	691
FSE	*b.* D'Entrecastreux ..	691
FSF	*b.* Formose	693
FSG	*b.* Garonna	693
FSH	*b.* Dahomey	691
FSI	*b.* Belle Isle	686
FSJ	*b.* Alesia FSJ ..	683
FSK	*b.* Massilia	697
FSL	*b.* Liger	696
FSM	*b.* Samara	702
FSN	*b.* Fort de Troyon ..	693
FSO	*b.* Baoulé	685
FSR	*c.* El Fasher	627
FSS	*b.* Fort de Souville ..	693
FST	*b.* Lutetia	697
FSU	*b.* Fort de Douamont	693
FSV	*b.* Fort de Vaux ..	693
FTA	*c.* Tabou	596
FTB	*b.* Niagara FTB ..	699
FTC	*b.* Caravelle	689
FTD	*b.* La Pérouse ..	696
FTE	*b.* Espagne FTE ..	692
FTF	*b.* S. Louis FTF ..	703
FTG	*b.* Garonne FTG ..	693
FTH	*b.* Hudson	695
FTI	*b.* Chicago FTI ..	690
FTJ	*b.* Jaques Cartier ..	695
FTK	*b.* Californie	689
FTL	*b.* Lorraine (La) FTL ..	696
FTM	*b.* Martinique ..	697
FTN	*b.* Navarre	699
FTO	*b.* Caroline FTO ..	689
FTP	*b.* Pérou	700
FTQ	*b.* S. Servan	704
FTR	*b.* Rochambeau ..	701
FTS	*b.* Savoie FTS	702
FTT	*b.* Touraine	705
FTU	*b.* Honduras	695
FTV	*b.* Virginie	707
FTX	*b.* Mexico FTX ..	698
FTY	*b.* Carbet	689
FTZ	*b.* France FTZ ..	693
FUA	*c.* Ben Negro-Gonio ..	630
FUA	*c.* Bizerte	630
FUC	*c.* Cherbourg-Rouges-Terres	592
FUC	*c.* Cherbourg Gonio ..	592
FUD	*c.* Dunkerque Castlenau	592
FUE	*c.* Mengam	593
FUH	*c.* Chemolin	592
FUI	*c.* Ajaccio-Aspretto ..	592
FUK	*c.* Oran Aïn el Turck ..	563
FUL	*c.* Calais	592
FUN	*c.* Lorient-Gonio ..	593
FUN	*c.* Lorient-Pen-Mané ..	592
FUQ	*c.* Porquerolles ..	593
FUR	*c.* Rochefort-sur-Mer ..	593
FUT	*c.* Toulon-Mourillon	594
FUX	*c.* Toulon Croix des Signaux	593
FVA	*b.* Savoie FVA ..	702
FVB	*b.* Sidi-Brahim ..	702
FVC	*b.* Mont-Cenis ..	698
FVD	*b.* Flandre FVD ..	693
FVE	*b.* Espagne FVE ..	692
FVF	*b.* Formosa FVF ..	693
FVG	*b.* Portugal FVG ..	701
FVH	*b.* Sidi-Abdullah ..	702
FVI	*b.* Ile de France ..	695
FVJ	*b.* Vladiva	706
FVK	*b.* Alsace	684
FVL	*b.* Plata FVL	700
FVM	*b.* Maine FVM ..	697
FVO	*b.* Aquitaine	685
FVQ	*b.* Mendoza	698
FVR	*b.* Mont Agel	698
FVT	*b.* Rigel	701
FVU	*b.* Mont Rose FVU ..	699

		PAGE
FVV	*b.* Mont-Cervin	698
FVW	*b.* Italie FVW	695
FVX	*b.* Mont Pelvux	698
FVY	*b.* Morbihan	699
FWA	*c.* Quang-Tchéou-Wan	583
FWA	*c.* Fort Bayard ..	594
FWB	*b.* Alsace FWB ..	684
FWC	*b.* Corneille	690
FWD	*b.* Magny	697
FWE	*b.* S. Eloi	703
FWF	*b.* Shouragallus ..	702
FWG	*b.* Gafsa	693
FWI	*b.* Alumine	684
FWJ	*b.* Jade	695
FWK	*b.* Frank Delmas ..	693
FWL	*b.* Lapeyrouse	696
FWM	*b.* Miquelon	698
FWN	*b.* Pontetcanet ..	701
FWO	*b.* La Fontaine ..	696
FWP	*b.* Pomerol	701
FWQ	*b.* Quartz	701
FWR	*b.* Château Palmer ..	689
FWS	*b.* Astrée FWS ..	685
FWT	*b.* Château Latour ..	689
FWU	*b.* Utique	706
FWV	*b.* André Pierré ..	684
FWW	*b.* Sephora Worms ..	702
FWX	*b.* Margause	697
FWY	*b.* Hyppolite Worms ..	695
FWZ	*b.* Suzanne et Marie FWZ	703
FXA	*b.* Montana FXA ..	698
FXB	*b.* Manouba	697
FXD	*b.* Maryland FXD ..	697
FXE	*b.* Oise FXE	699
FXF	*b.* Felix-Touache ..	693
FXG	*b.* Tavignano ..	704
FXH	*b.* Rhone FXH ..	701
FXI	*b.* Ontario FXI ..	699
FXJ	*b.* S. Joseph	703
FXK	*b.* Lamoricière ..	696
FXL	*b.* Graville	694
FXM	*b.* Mustapha II ..	699
FXN	*b.* Radioleine ..	701
FXP	*b.* Rhin (Le)	701
FXR	*b.* Marsa (La)	697
FXT	*b.* Tafna FXT ..	704
FXU	*b.* Missouri FXU ..	698
FXV	*b.* Roussilon	702
FXX	*b.* Volubilis	707
FXY	*b.* Moulouya ..	699
FXZ	*b.* Mansoura ..	697
FYA	*b.* Atmah	685
FYB	*b.* Bacchante ..	685
FYC	*b.* Cambrai	689
FYD	*b.* Labrador FYD ..	696
FYE	*b.* Notre Dame d'Espérance	699
FYF	*b.* Ville de Cette ..	706
FYG	*b.* Algérie	683
FYH	*b.* Carol I	689
FYI	*b.* Ariadne	685
FYJ	*b.* Sierentz	703
FYK	*b.* Atlantique FYK ..	685
FYL	*b.* Leopold L.D. ..	696
FYM	*b.* Maroc	697
FYN	*b.* Emilie L.D. ..	692
FYO	*b.* Océan FYO ..	699
FYP	*b.* Apache FYP ..	684
FYQ	*b.* Président-Le-Roy-Lallier	701
FYR	*b.* Nicholas Norbert ..	699
FYS	*b.* Eros FYS	692
FYT	*b.* Mauritanie	697
FYU	*b.* Resolue	701
FYV	*b.* Notre Dame des Dunes	699
FYV	*b.* Véga FYV	706
FYW	*b.* Savoie FYW ..	702
FYX	*b.* Gaulois	693
FYY	*b.* La Manche ..	697
FZA	*b.* La France FZA ..	693
FZB	*b.* Arlette	685
FZC	*b.* Brest	686
FZE	*b.* Angers	684
FZG	*b.* Bordeaux FZG ..	686
FZH	*b.* Newhaven FZH ..	699
FZI	*b.* Portiers	700
FZJ	*b.* Edouard Jéramec ..	691
FZK	*b.* Emile Baudot ..	692
FZM	*b.* Notre Dame de la Mer	699
FZN	*b.* Nord	699
FZP	*b.* Pas de Calais ..	700
FZQ	*b.* Ustaritz	706
FZR	*b.* Rouen FZR ..	702
FZS	*b.* S. Jehanne ..	703
FZT	*b.* Pouyer-quertier ..	701
FZV	*b.* Tours FZV	705
FZY	*b.* Portsmouth FZY ..	701
FABC	*b.* Renne	701
FABD	*b.* Vanneau II ..	706
FABE	*b.* Béthune	686
FABG	*b.* Gueydon	694
FABH	*b.* Bien-Hoa	686
FABI	*b.* C.24	687
FABJ	*b.* Crabe	691
FABK	*b.* Gaston River ..	693
FABL	*b.* Belfort FABL ..	686
FABM	*b.* Victoire III ..	706
FABN	*b.* Balny	685
FABO	*b.* Bellone	686
FABP	*b.* Provence FABP ..	701
FABQ	*b.* Sonde	703
FABR	*b.* Bout-Dehors ..	686
FABS	*b.* Octant	699
FABT	*b.* Astrolabe	685
FABU	*b.* Huron FABU ..	695
FABV	*b.* Thetys	704
FABW	*b.* Torpilleur 342 ..	705
FABX	*b.* Vigoureux II ..	706
FABY	*b.* O'Byrne	699
FABZ	*b.* C.27	687
FACD	*b.* Diderot	691
FACE	*b.* Centaure	689
FACG	*b.* Torpilleur 306 ..	705
FACH	*b.* Chamois	689
FACI	*b.* Clématite	690
FACJ	*b.* C.31	687
FACL	*b.* Clorinde	690
FACM	*b.* Clameur	690
FACO	*b.* Courbet	691
FACP	*b.* Paul-Chailley ..	700
FACQ	*b.* Coq FACQ ..	690
FACR	*b.* Chateaurenault ..	689
FACT	*b.* Actif	683
FACU	*b.* C.51	687

		PAGE			PAGE
FARN	*b.* Ernest	692	FAYG	*b.* C.77	688
FARV	*b.* Brumaire	687	FAYJ	*b.* Jules-Ferry.. ..	695
FARV	*b.* Revigny	701	FAYL	*b.* Renée	701
FARW	*b.* Waldeck - Rousseau	707	FAYL	*b.* Torpilleur 312 ..	705
FARY	*b.* Faraday FARY ..	692	FAYP	*b.* Pintade	700
FARZ	*b.* Torpilleur 359 ..	705	FAYU	*b.* C.28	687
FASD	*b.* Cassard	689	FAYW	*b.* C.60	688
FASI	*b.* Simoun	703	FAZD	*b.* Torpilleur 336 ..	705
FASJ	*b.* C.2	687	FAZE	*b.* Escaut	692
FASM	*b.* Samson	702	FAZG	*b.* Torpilleur 362 ..	705
FASN	*b.* Sané	702	FAZH	*b.* C.62	688
FASO	*b.* Séminole FASO ..	702	FAZN	*b.* Narval	699
FASP	*b.* Paris FASP ..	700	FAZO	*b.* Romazotti	701
FASR	*b.* Astrée FASR ..	685	FAZS	*b.* C.25	687
FASY	*b.* C.45	687	FAZU	*b.* Zébu	707
FASZ	*b.* Torpilleur 278 ..	704	FAZV	*b.* Frondeur	693
FATB	*b.* Trombe	705	FBAC	*b.* Baccarat FBAC ..	685
FATC	*b.* Coquelicot	690	FBAE	*b.* Arbalète	685
FATD	*b.* Torpilleur 299 ..	704	FBAG	*b.* Algérien	683
FATE	*b.* Démocratie ..	691	FBAI	*b.* Aisne	683
FATG	*b.* Taillebourg ..	704	FBAK	*b.* C.46	687
FATH	*b.* Aréthuse	685	FBAL	*b.* C.78	688
FATI	*b.* C.57	688	FBAM	*b.* Annamite	685
FATL	*b.* Athlète FATL ..	685	FBAN	*b.* Annibal	685
FATO	*b.* Tourteau	705	FBAP	*b.* Apache FBAP ..	685
FATP	*b.* Antilope	685	FBAR	*b.* Ardent	685
FATR	*b.* Râteau	701	FBAT	*b.* Batailleuse	686
FATU	*b.* Thuya	704	FBAV	*b.* Aventurier	685
FATV	*b.* Volta	707	FBAX	*b.* Faisan	692
FATY	*b.* Typhon	705	FBAY	*b.* Torpilleur 305 ..	704
FATZ	*b.* Tzar Nicolas II ..	706	FBCA	*b.* Calais	689
FAUC	*b.* Canard	689	FBCE	*b.* Érable	692
FAUG	*b.* Guichen	694	FBCG	*b.* Courageuse.. ..	690
FAUI	*b.* Utile	706	FBCH	*b.* Champlain FBCH..	689
FAUL	*b.* Euler	692	FBCL	*b.* Torpilleur 250 ..	704
FAUM	*b.* Michel et Renée ..	698	FBCM	*b.* Cimeterre	690
FAUN	*b.* C.44	687	FBCO	*b.* Colombe	690
FAUO	*b.* Fulton FAUO ..	693	FBCQ	*b.* Casque	689
FAUR	*b.* Curie	691	FBCR	*b.* Caroubier	689
FAUX	*b.* C.61	688	FBCS	*b.* Sabre FBCS ..	702
FAUY	*b.* Dupuy-de-Lôme ..	691	FBCT	*b.* Coëtlogon	690
FAUZ	*b.* Torpilleur 350 ..	705	FBCV	*b.* Cavalier	689
FAVB	*b.* C.23	687	FBCY	*b.* Coucy	690
FAVC	*b.* Vaucluse FAVC ..	706	FBCZ	*b.* Capricieuse.. ..	689
FAVG	*b.* Vague	706	FBDC	*b.* Du Chaffault ..	691
FAVH	*b.* Victor Hugo ..	706	FBDG	*b.* Dugay-Trouin ..	691
FAVI	*b.* Iskheul	695	FBDH	*b.* Dehorter	691
FAVK	*b.* Torpilleur 361 ..	705	FBDJ	*b.* C.37.. ..	687
FAVL	*b.* Vinh-Long	707	FBDK	*b.* Ducovëdic FBDK..	691
FAVO	*b.* Lavoisier	696	FBDL	*b.* Diligente	691
FAVR	*b.* Le Verrier	696	FBDN	*b.* Dédaigneuse ..	691
FAVS	*b.* C.64	688	FBDQ	*b.* C. 91	688
FAVW	*b.* Torpilleur 366 ..	705	FBDR	*b.* Torpilleur 263 ..	704
FAVX	*b.* Vigoureux	706	FBDU	*b.* Dubourdieu ..	691
FAVY	*b.* Torpilleur 296 ..	704	FBDV	*b.* Dumont d'Urville..	691
FAWB	*b.* Brave	686	FBDY	*b.* Torpilleur 297 ..	704
FAWG	*b.* Grès..	694	FBDZ	*b.* C.47	687
FAWM	*b.* Milon	698	FBEC	*b.* Conquérante ..	690
FAWO	*b.* C.35	687	FBEK	*b.* Torpilleur 274 ..	704
FAWR	*b.* Torpilleur 330 ..	705	FBEL	*b.* Commandant Lucas	690
FAWS	*b.* Torpilleur 360 ..	705	FBEP	*b.* Espiègle FBEP ..	692
FAWT	*b.* Newton FAWT ..	699	FBET	*b.* Bellatrix FBET ..	686
FAWY	*b.* Frêne	693	FBEV	*b.* Évillé	692
FAXD	*b.* Desaix	691	FBEW	*b.* C.29	687
FAXI	*b.* Infatigable	695	FBEY	*b.* Enseigne-Henry ..	692
FAXL	*b.* C.65	688	FBEZ	*b.* Torpilleur 351 ..	705
FAXN	*b.* France FAXN ..	693	FBGD	*b.* Décidée	691
FAXQ	*b.* Elen..	691	FBGH	*b.* Héron II	695
FAXV	*b.* Fantasque	692	FBGL	*b.* Algol	684

		PAGE
FBGM	*b.* Méhari	697
FBGN	*b.* Granit	694
FBGP	*b.* Polyphème	700
FBGR	*b.* Grondeur	694
FBGS	*b.* Gracieuse	694
FBGV	*b.* Glaive	694
FBGW	*b.* C.88	688
FBGZ	*b.* Torpilleur 307	705
FBHA	*b.* Hamelin	694
FBHC	*b.* Carquois	689
FBHD	*b.* C.32	687
FBHI	*b.* Henriette FBHI	694
FBHM	*b.* Homard	695
FBHO	*b.* Hova	695
FBHP	*b.* Hippopotame	695
FBHR	*b.* Aspirant-Herber	685
FBHT	*b.* Hêtre	695
FBHU	*b.* Hussard	695
FBHW	*b.* Torpilleur 302	704
FBHY	*b.* Torpilleur 352	705
FBHZ	*b.* Fracas	693
FBIC	*b.* Inconstant FBIC	695
FBID	*b.* C.89	688
FBIK	*b.* Inca FBIK	695
FBIO	*b.* Cassiopée	689
FBIP	*b.* Pinson I	700
FBIQ	*b.* Belliqueuse	686
FBIS	*b.* Bisson FBIS	686
FBIV	*b.* Vautour	706
FBIX	*b.* Fanfare	692
FBJC	*b.* Cactus	689
FBJE	*b.* Epernay	692
FBJI	*b.* Impétueuse	695
FBJL	*b.* Mécanicien principal Lestin	697
FBJR	*b.* Orage	699
FBJS	*b.* Sans-Souci	702
FBJU	*b.* C.70	688
FBJY	*b.* Joyeuse	695
FBJZ	*b.* C.83	688
FBKD	*b.* Audacieuse	685
FBKH	*b.* Sakalave	702
FBKL	*b.* Flambant	693
FBKN	*b.* Renard	701
FBKN	*b.* Tonkinois	704
FBKP	*b.* Poignard	700
FBKU	*b.* Fauconneau	693
FBKX	*b.* Torpilleur 308	705
FBKY	*b.* Kabyle	696
FBKZ	*b.* C.90	688
FBLA	*b.* Alerte	683
FBLC	*b.* Curieuse	691
FBLD	*b.* Bar-le-Duc	686
FBLE	*b.* Bélier	686
FBLG	*b.* Gélinotte	693
FBLK	*b.* Mameluck	697
FBLN	*b.* Lantana	696
FBLO	*b.* Lobélia	696
FBLP	*b.* Lapérousse	696
FBLQ	*b.* Lansquenet	696
FBLS	*b.* Lassigny	696
FBLT	*b.* Altaïr	684
FBLU	*b.* Luronne	697
FBLV	*b.* Loup-Cervier	697
FBLX	*b.* C.87	688
FBMA	*b.* Antarès	685
FBMD	*b.* C.95	688
FBME	*b.* Epieu	692
FBMG	*b.* Mangini	697
FBMH	*b.* Mammouth	697
FBMI	*b.* Montmirail	698
FBML	*b.* Mistral	698
FBMO	*b.* Mondement	698
FBMR	*b.* Bambara	685
FBMU	*b.* Massue	697
FBMV	*b.* C.16	687
FBMW	*b.* Torpilleur 314	705
FBMX	*b.* C.36	687
FBMY	*b.* Torpilleur 357	705
FBMZ	*b.* C.76	688
FBNA	*b.* Nancy	699
FBNC	*b.* Ancre	684
FBNH	*b.* C.66	688
FBNI	*b.* Fanion	692
FBNL	*b.* Torpilleur 269	704
FBNM	*b.* Mortier	699
FBNP	*b.* Prado	701
FBNS	*b.* Torpilleur 337	705
FBNT	*b.* Engageante	692
FBNV	*b.* Vacarme	706
FBNW	*b.* C.38	687
FBNX	*b.* Torpilleur 365	705
FBOC	*b.* Marocain	697
FBOD	*b.* C. 68	688
FBOI	*b.* Oise	699
FBOK	*b.* Torpilleur 327	705
FBOL	*b.* Loup	697
FBOM	*b.* Somali FBOM	703
FBON	*b.* Bouffonne	686
FBOP	*b.* Opiniâtre	699
FBOQ	*b.* C.19	687
FBOS	*b.* Obusier	699
FBOU	*b.* Bouclier	686
FBOV	*b.* C. 9	687
FBOW	*b.* C. 15	687
FBOY	*b.* Torpilleur 315	705
FBOZ	*b.* C 94	688
FBPA	*b.* Ailette	683
FBPE	*b.* Pertuisane	700
FBPG	*b.* Primauguet	701
FBPI	*b.* Pierrier	700
FBPK	*b.* C. 13	687
FBPL	*b.* Peuplier	700
FBPM	*b* Bapaume	685
FBPN	*b.* Paon	700
FBPO	*b.* Emporté	692
FBPR	*b.* Protêt	701
FBPS	*b.* Séduisant	702
FBPT	*b.* Tintamarre	704
FBPY	*b.* C. 4 FBPY	687
FBPZ	*b.* Torpilleur 363	705
FBQE	*b.* Escopette	692
FBQG	*b.* Torpilleur 288	704
FBQH	*b.* Hache	694
FBQI	*b.* Ipéca	695
FBQK	*b.* C. 98	689
FBQL	*b.* C. 92	688
FBQM	*b.* Meuse	698
FBQN	*b.* Orme	699
FBQO	*b.* Oriflamme	699
FBQR	*b.* Régulus FBQR	701
FBQS	*b.* Sirocco	703
FBQW	*b.* C. 75	688
FBQX	*b.* Torpilleur 369	705
FBQY	*b.* Ondine II	699
FBQZ	*b.* Torpilleur 316	705
FBRA	*b.* Arabe	685
FBRE	*b.* Reims	701

		PAGE
FBRH	*b.* Rhinoceros ..	701
FBRI	*b.* CommandantRiviere	690
FBRJ	*b.* C. 18	687
FBRL	*b.* Rafale	701
FBRM	*b.* Remiremont ..	701
FBRN	*b.* René	701
FBRS	*b.* Sagaie	702
FBRU	*b.* Robuste	701
FBRW	*b.* C. 5	687
FBRY	*b.* Commandant Bory	690
FBRZ	*b.* Torpilleur 326 ..	705
FBSA	*b.* Sape	702
FBSC	*b.* Scarpe	702
FBSG	*b.* Sanglier	702
FBSI	*b.* Sioux	703
FBSJ	*b.* Sajou	702
FBSL	*b.* Sénégalais	702
FBSM	*b.* Marbre	697
FBSN	*b.* Sentinelle	702
FBSO	*b.* Somme FBSO ..	703
FBSP	*b.* Spahi	703
FBSR	*b.* Sarigue	702
FBSV	*b.* Surveillante ..	703
FBSW	*b.* Torpilleur 318 ..	705
FBSY	*b.* Seignelay	702
FBTA	*b.* Tapageuse	704
FBTC	*b.* Camélia	689
FBTG	*b.* Touareg	705
FBTH	*b.* Tahure	704
FBTI	*b.* Tirailleur	704
FBTL	*b.* Toul	705
FBTM	*b.* Magon	697
FBTN	*b.* Tramontane ..	705
FBTQ	*b.* C. 14	687
FBTU	*b.* Tumulte	705
FBTV	*b.* C.93	688
FBUC	*b.* Cognée	690
FBUD	*b.* C. 73	688
FBUH	*b.* C. 20	687
FBUI	*b.* Suippe	703
FBUL	*b.* Buffle	687
FBUP	*b.* Pique	700
FBUV	*b.* C. 67	688
FBUX	*b.* C. 86	688
FBUZ	*b.* Torpilleur 321 ..	705
FBVA	*b.* Vaillante	706
FBVD	*b.* Verdun	706
FBVH	*b.* La Hire	696
FBVI	*b.* Victoire	706
FBVJ	*b.* C. 74	688
FBVL	*b.* Vitry-le-François ..	707
FBVM	*b.* Malicieuse	697
FBVP	*b.* C. 99	689
FBVQ	*b.* Vauquois	706
FBVR	*b.* Rapière	701
FBVT	*b.* Trident FBVT ..	705
FBVU	*b.* C. 59	688
FBVX	*b.* C. 21	687
FBVY	*b.* Ville d'Ys	707
FBVZ	*b.* C 8	687
FBWA	*b.* Aigle	683
FBWC	*b.* Claymore	690
FBWH	*b.* Hardi	694
FBWI	*b.* Intrépide	695
FBWM	*b.* Marcassin	697
FBWQ	*b.* Francisque	693
FBWR	*b.* Ramier	701
FBWU	*b.* Torpilleur 338 ..	705
FBWX	*b.* C. 12	687

		PAGE
FBXA	*b.* Arras	685
FBXE	*b.* Étourdi	692
FBXG	*b.* Francis-Garnier ..	693
FBXM	*b.* Moqueuse	699
FBXR	*b.* Enseigne-Roux ..	692
FBXU	*b.* Torpilleur 339 ..	705
FBXW	*b.* Torpilleur 340 ..	705
FBYC	*b.* Capitaine-Mehl ..	689
FBYG	*b.* Torpilleur 349 ..	705
FBYP	*b.* Torpilleur 310 ..	705
FBYR	*b.* Yser FBYR ..	707
FBYT	*b.* Torpilleur 324 ..	705
FBYU	*b.* Yucca FBYU ..	707
FBYX	*b.* Torpilleur 341 ..	705
FBYZ	*b.* C. 10	687
FBZC	*b.* Coutelas	691
FBZH	*b.* Harpon	694
FBZK	*b.* Torpilleur 334 ..	705
FBZM	*b.* Marne FBZM ..	697
FBZN	*b.* Némésia	699
FBZQ	*b.* C. 69	688
FBZR	*b.* Railleuse	701
FBZT	*b.* Téméraire FBZT	704
FBZV	*b.* Torpilleur 322 ..	705
FBZW	*b.* C. 97	689
FBZY	*b.* Fier	693
GB	*c.* Glace Bay	579
GM	*c.* Stettin	599
GAB	*b.* Homer City ..	843
GAC	*b.* Bangala	808
GAD	*b.* Bharata	811
GAF	*b.* Canara	815
GAG	*b.* Rooke	875
GAM	*b.* Tyne	888
GAN	*b.* Eileen	831
GAO	*b.* City of York ..	820
GAQ	*b.* Osiris	866
GAR	*b.* Chindwara	818
GAX	*b.* Marnetown.. ..	856
GBB	*b.* City of Poona ..	810
GBC	*b.* Coronado	826
GBE	*b.* Niagara	863
GBF	*b.* Elswick Grange ..	832
GBG	*b.* Nevasa	802
GBJ	*b.* Benalla	810
GBN	*b.* Bloemfontein ..	812
GBO	*b* Gujarat	840
GBP	*b.* Kasama	817
GBQ	*b.* Nestor	862
GBS	*b.* Toronto GBS ..	887
GBT	*b.* Colaba	825
GBU	*b.* Ulysses	880
GBV	*b.* Cooeyanna	825
GBW	*b.* City of Karachi ..	819
GBX	*b.* Pinewin	869
GBY	*b.* Kalomo	847
GCA	*c.* Tobermory Radio ..	635
GCB	*c.* Lochboisdale Radio	633
GCC	*c* Cullercoats Radio ..	632
GCD	*b.* Nagoya	861
GCE	*b.* Custodian	827
GCF	*b.* Dilwara	829
GCH	*b.* Bankura	808
GCI	*b.* Wayfarer	803
GCJ	*b.* Ardeola	805
GCK	*c.* Valentia Radio ..	635
GCL	*b.* Borderer	812
GCM	*b.* Barala	808
GCS	*c.* Caister-on-Sea Radio	631

		PAGE
GCT	*b.* Barjora	808
GCU	*b.* Dunera	830
GCV	*b.* Neuralia	862
GCW	*b.* Novara	864
GCX	*b.* Waroonga	892
GCY	*b.* Poleric	869
GCZ	*b.* Euryalus	833
GDB	*b.* Patuca	867
GDC	*b.* Fultala	835
GDD	*b.* City of Dunkirk	819
GDF	*b.* Gracchus	839
GDG	*b.* Tennyson	885
GDH	*b.* Byron	815
GDJ	*b.* Appam	805
GDK	*b.* Chaudière	817
GDL	*b.* Baroda	809
GDN	*b.* Kentucky	848
GDO	*b.* Bovic	813
GDP	*b.* City of Lincoln	819
GDR	*b.* Cufic	827
GDU	*b.* Tropic	888
GDV	*b.* Ingoma	845
GDW	*b.* Cornishman	826
GDX	*c.* Isle of Man Radio	633
GEC	*c.* Castle Bromwich Radio	631
GED	*c.* Croydon Radio	632
GEG	*c.* Lympne Radio	633
GEL	*c.* Lerwick Radio	633
GEM	*c.* Didsbury	632
GEP	*c.* Pulham	634
GER	*c.* Renfrew Radio	635
GFA	*c.* Air Ministry	631
GFB	*c.* Baldonnel	631
GFC	*c.* Cranwell	631
GFF	*c.* Felixstowe	632
GFG	*c.* Grain	633
GFI	*b.* Amber	803
GFI	*c.* Andover	631
GFK	*c.* Donibristle	632
GFL	*c.* Calshot	631
GFM	*c.* Cattewater	631
GFO	*c.* Shotwick	635
GFW	*c.* Lee-on-Solent	633
GFZ	*c.* Howden	633
GHD	*b.* Wiltshire	893
GIB	*b.* S. George GIB	883
GIC	*b.* City of Delhi	819
GIE	*b.* Trewellard	888
GIF	*b.* Berbice	811
GII	*b.* Galileo	836
GIL	*b.* Hantonia	841
GIR	*b.* Highland Glen	842
GIT	*b.* Manora	855
GIU	*b.* Highland Laddie	842
GIX	*b.* Carventum	816
GIY	*b.* Highland Loch	842
GIZ	*b.* Rimouski	874
GJA	*b.* Highland Pride	842
GJB	*b.* Highland Rover	842
GJE	*b.* Honorius	843
GJF	*b.* Huanchaco	843
GJG	*b.* Hyacinthus	844
GJH	*b.* Hydaspes	844
GJI	*b.* Hypatia	844
GJJ	*b.* Idaho	844
GJK	*b.* Irishman	845
GJL	*b.* Junin	846
GJN	*b.* Lama	849
GJO	*b.* Kenuta	848
GJP	*b.* Kia Ora	848
GJQ	*b.* Kumeric	849
GJV	*b.* Lackawanna	849
GJW	*b.* Rosarina (La)	850
GJX	*b.* Shakespear	879
GJY	*b.* Levant II	851
GKA	*c.* Guernsey Radio	633
GKC	*b.* Ashtabula	806
GKD	*b.* Malta	854
GKE	*b.* Mamari	854
GKF	*b.* Lhasa	851
GKG	*b.* Canning	815
GKG	*c.* Heysham Harbour Radio	633
GKH	*b.* Manchester City	854
GKJ	*b.* Marengo	856
GKK	*b.* Manhattan	855
GKL	*b.* Matatua	857
GKM	*b.* Michigan	859
GKO	*b.* Naneric	861
GKP	*b.* Nankin	861
GKR	*c.* Wick Radio	635
GKS	*b.* Knight Companion	848
GKT	*b.* Knight Templar	848
GKU	*c.* Devizes Radio	632
GKV	*b.* Nore	863
GKW	*b.* Normannia GKW	863
GKY	*b.* Nyanza	864
GLC	*b.* Paris GLC	867
GLD	*c.* Land's End Rad	633
GLF	*b.* Kathlamba	847
GLG	*b.* Pakeha	866
GLH	*b.* Jason GLH	845
GLI	*b.* Cameronian	815
GLJ	*b.* Linga	851
GLK	*b.* Parana	867
GLL	*b.* Pardo	867
GLM	*b.* Lunka	852
GLN	*b.* Peru GLN	808
GLQ	*b.* Potomac	871
GLR	*b.* Prince George GLR	871
GLS	*b.* Prince Rupert	872
GLT	*b.* Quilpue	873
GLU	*b.* Ramos	873
GLV	*c.* Seaforth Radio	635
GLY	*b.* Roseric	876
GLZ	*b.* Royston Grange	876
GMB	*b.* Sardinia	877
GMC	*b.* Sicilia GMC	879
GMD	*b.* Silvertown	880
GMH	*c.* Malin Head Rad	634
GMI	*b.* Indore	845
GMJ	*b.* Muttra	861
GMK	*b.* Bayano	809
GML	*b.* Obra	864
GMM	*b.* Sutherland Grange	883
GMN	*b.* Chaleur	817
GMO	*b.* Suveric	883
GMP	*b.* Syria GMP	883
GMQ	*b.* Tara	885
GMR	*c.* Gambela	558
GMR	*b.* Taroba	885
GMT	*b.* Teesta	885
GMU	*b.* Thongwa	886
GMV	*b.* Tonawanda	887
GMW	*b.* Okara	864
GMX	*b.* Antiope	805
GMY	*b.* Merkara	859

		PAGE
GMZ	*b.* Vasari	889
GNA	*b.* Kamarima ..	847
GNC	*b.* City of Edinburgh ..	819
GNE	*b.* Waimana ..	891
GNF	*c.* North Foreland Radio	634
GNI	*c.* Niton Radio ..	634
GNJ	*c.* Fastnet	632
GNK	*b.* Waipara	891
GNL	*b.* Onda	865
GNM	*b.* Highland Piper ..	842
GNR	*b.* S. Tudno	884
GNS	*b.* Karroo	847
GNU	*b.* Oolobaria	865
GNV	*c.* Newhaven Radio ..	634
GNW	*b.* Orissa	865
GNX	*b.* Trelissick	887
GNY	*b.* Orna	865
GNZ	*b.* Ozarda	866
GOA	*b.* Queda	872
GOB	*b.* Querimba	873
GOC	*b.* Quiloa	873
GOD	*b.* Sangola	877
GOE	*b.* Santhia	877
GOF	*b.* Sealda	878
GOG	*b.* Southmead ..	881
GOH	*b.* Sofala	881
GOJ	*b.* Torilla	887
GOL	*b.* Ula	889
GOM	*b.* Trevarrack ..	887
GON	*b.* Umta	889
GOO	*b.* Upada	889
GOP	*b.* Urlana	889
GOQ	*b.* Culna	827
GOR	*b.* Ujina	889
GOU	*b.* North Sands ..	863
GOV	*b.* Pentaur	868
GOX	*b.* Trecarrell	887
GOY	*b.* Trematon	887
GOZ	*b.* Wulsty Castle ..	895
GPE	*b.* Chakrata	817
GPF	*b.* Amsterdam ..	804
GPH	*c.* Guayaquil	589
GPL	*b.* Roulers	876
GPN	*b.* Antrim	805
GPP	*b.* Duchess of Devonshire	830
GPQ	*c.* Parkeston Quay Radio	634
GPR	*b.* Londonderry ..	851
GPT	*b.* Chanda	817
GPU	*b.* Chupra	818
GPV	*b.* Nessian	862
GPW	*b.* Lakonia	849
GPZ	*b.* Escalona	833
GQA	*b.* Ayrshire	807
GQB	*b.* Perthshire	868
GQC	*b.* Durham GQC ..	831
GQE	*b.* Sequoya	728
GQM	*c.* Inishtrahull Radio ..	588
GQO	*b.* Transmitter ..	887
GQP	*b.* Munardan	861
GQR	*b.* Lady Crundall ..	849
GQS	*b.* Lady Brassey ..	849
GQW	*b.* Australind	807
GQY	*b.* Telesfora de Larrinaga	885
GQZ	*b.* Manco	855
GRB	*b.* Baron Polwarth ..	809
GRD	*b.* Willkeno	893
GRG	*b.* Arvonia GRG ..	806

		PAGE
GRI	*b.* Mississippi ..	859
GRJ	*b.* Kurdistan	849
GRK	*b.* Trivia	888
GRL	*c.* Fishguard Radio ..	632
GRM	*b.* Volumnia	891
GRN	*c.* Rathlin Island Radio	635
GRO	*b.* Egba	831
GRP	*b.* Burmese Prince ..	814
GRR	*b.* Menevia	858
GRS	*b.* Portuguese Prince	871
GRT	*b.* Sittang	880
GRU	*b.* Katherine Park ..	847
GRV	*b.* Suffolk	882
GRX	*b.* Trentino	887
GRY	*b.* Dorset	829
GRZ	*b.* Ixion	845
GSA	*b.* Uncus	728
GSB	*b.* Port Macquarric ..	871
GSC	*b.* Protesilaus	872
GSD	*b.* Tascalusa	728
GSF	*b.* Shropshire ..	879
GSG	*b.* Tamaha	728
GSH	*b.* Talthybius	885
GSI	*b.* Tahchee	728
GSJ	*b.* Teucer	885
GSK	*b.* Tatarrax	885
GSL	*c.* Ballycastle Radio ..	631
GSM	*b.* Winamac	728
GSO	*b.* Titan GSO ..	886
GSS	*b.* Shabonee	728
GSW	*c.* Stonehaven Radio ..	635
GTC	*b.* Antilochus	805
GTD	*b.* Bellerophon ..	810
GTF	*b.* Cyclops	827
GTG	*b.* Satanta	877
GTI	*b.* Otarama	866
GTJ	*b.* Argyllshire ..	805
GTL	*b.* Oanfa	864
GTN	*b.* Wabasha	728
GTP	*b.* Faraday GTP ..	834
GTR	*b.* Masconomo ..	728
GTS	*b.* Monarch GTS ..	859
GTV	*b.* Oneka	728
GTX	*b.* Wilston	893
GTY	*b.* Aspinet	728
GTZ	*b.* Port Lincoln ..	871
GUA	*b.* Arakaka	805
GUB	*b.* Anglo-Saxon ..	804
GUC	*b.* Magdalena	853
GUD	*b.* Orotava GUD ..	865
GUH	*b.* Trent	887
GUI	*b.* Empress	832
GUJ	*b.* City of Bombay ..	819
GUK	*b.* Engadine	632
GUL	*b.* Invicta	845
GUM	*b.* Onward	865
GUO	*b.* Riviera	875
GUQ	*b.* Minia	859
GUR	*c.* Folkestone Harbour Radio	633
GUS	*b.* Greenore	839
GUT	*b.* Rathmore	873
GUU	*b.* Galtee More ..	836
GUX	*b.* Asiatic	806
GUZ	*b.* Ajax	802
GVA	*c.* Cross Sand Lightship	632
GVB	*c.* East Goodwin Lightship	632

		PAGE
GVC	*c.* Gull Lightship ..	633
GVD	*c.* South Goodwin Lightship ..	635
GVE	*c.* Sunk Lightship ..	635
GVF	*c.* Tongue Lightship ..	635
GVH	*b.* Buteshire	815
GVI	*b.* Malakuta	854
GVJ	*b.* Mahanada	853
GVK	*b.* Ericus	832
GVL	*b.* Clan Macquarrie ..	823
GVM	*b.* Banffshire	808
GVN	*b.* Maidan	853
GVO	*b.* Nolisement ..	803
GVQ	*b.* Netherinead ..	862
GVR	*b.* Cento	817
GVS	*b.* Clan Macgillivray ..	821
GVT	*b.* Burma	814
GVU	*b.* Clan Ross	824
GVV	*b.* Clan Ogilvy ..	823
GVX	*b.* Ethelfreda ..	833
GVY	*b.* Turkistan	888
GVZ	*b.* Cauca	817
GWA	*b.* Bhamo	811
GWC	*b.* Martaban	857
GWD	*b.* Henzada	841
GWG	*b.* Chindwin	818
GWH	*b.* Maraval	856
GWI	*b.* Port Albany ..	870
GWJ	*b.* Ganges	836
GWK	*b.* Chenab	817
GWL	*b.* Sutlej	883
GWO	*b.* Arracan	806
GWP	*b.* Mandalay	855
GWV	*b.* Michael	859
GWW	*b.* Alban	803
GWX	*b.* Glenbridge	837
GWZ	*b.* Meissonier	858
GXA	*b.* Tregantle	887
GXB	*b.* Virgilia	891
GXC	*b.* Apollo GXC ..	805
GXD	*b.* Scientist	878
GXE	*b.* Essex	833
GXF	*b.* Songster	881
GXH	*b.* Coya	827
GXI	*b.* Capac	815
GXK	*b.* Weltondale ..	893
GXM	*b.* Mull	861
GXO	*c.* Crookhaven ..	632
GXQ	*b.* Burnhope ..	815
GXS	*b.* Ambassador ..	803
GXT	*b.* Leafield	850
GXU	*b.* Huntscape	843
GXW	*b.* Clumberhall ..	825
GXX	*b.* Arncliffe	806
GXY	*b.* Carston	816
GYA	*b.* City of Norwich ..	819
GYB	*b.* Ophir GYB ..	865
GYD	*b.* Matura	857
GYF	*b.* Exmouth II ..	833
GYG	*b.* City of Colombo ..	819
GYH	*b.* Empress of France	832
GYJ	*b.* S. Andrew GYJ ..	883
GYL	*b.* S. David	883
GYM	*b.* S. Patrick GYM ..	884
GYN	*b.* S. Fraterno ..	883
GYO	*b.* Manavi	854
GYQ	*b.* Kazembe	847
GYS	*b.* Vitruvia	891
GYX	*b.* Ben Nevis	811
GYY	*b.* Koranna	849
GZC	*b.* Djerissa	829
GZG	*b.* Warszawa	892
GZH	*b.* Tacoma	728
GZJ	*b.* Stockwell	882
GZM	*b.* Clan Mackellar ..	822
GZX	*b.* Minnedosa ..	859
GZY	*b.* Idomeneus	844
G'IA	*c.* Alessandria.. ..	603
G'IB	*c.* Catania	603
G'IC	*c.* Cuneo	604
G'ID	*c.* Cagliari	603
G'IF	*c.* Firenzi	604
G'IG	*c.* Genova	604
G'IH	*c.* Chieti	604
G'IK	*c.* Catanzaro	603
G'IL	*c.* Potenza	605
G'IN	*c.* Novara	605
G'IP	*c.* Perugia	605
G'IR	*c.* Roma	605
G'IS	*c.* Salerno	605
G'IU	*c.* Ancona G'IU ..	603
G'IZ	*c.* Torino	605
G'RD	*c.* Verona	605
G'RF	*c.* Ravenna	605
G'RH	*c.* Bologna	603
G'RJ	*c.* Milano	604
G'RK	*c.* Picenza	605
G'RP	*c.* Brescia	603
G'RV	*c.* Padova	605
GABC	*b.* Adelaide	657
GABD	*b.* Anzac	657
GABL	*b.* Fantome	659
GABM	*b.* Geranium	659
GABN	*b.* Huon	659
GABP	*b.* Mallow	660
GABQ	*b.* Marguerite	660
GABT	*b.* Platypus	660
GABW	*b.* Stalwart	660
GABX	*b.* Submarine J.1 ..	660
GABY	*b.* Submarine J.2 ..	660
GABZ	*b.* Submarine J.3 ..	660
GACB	*b.* Submarine J.4 ..	660
GACD	*b.* Submarine J.5 ..	660
GACF	*b.* Submarine J.7 ..	660
GACH	*b.* Success	660
GACK	*b.* Swordsman.. ..	660
GACM	*b.* Tasmania GACM ..	660
GACN	*b.* Tattoo	660
GBCD	*b.* Kronenfels	849
GBCF	*b.* Tredenham ..	887
GBCJ	*b.* Chemnitz	817
GBCK	*b.* Matadi	857
GBCL	*b.* Bradford City ..	813
GBCN	*b.* Wentworth ..	893
GBCP	*b.* Leicester	850
GBCQ	*b.* Hesione	842
GBCQ	*b.* Itajahy	845
GBCR	*b.* Cordoba GBCR ..	826
GBCS	*b.* Bourne	812
GBCT	*b.* Regina GBCT ..	874
GBCV	*b.* Germanicus ..	836
GBCW	*b.* Merton Hall ..	859
GBCX	*b.* Furst Bulow ..	835
GBCY	*b.* Rubens	877
GBCZ	*b.* Clare Hugo Stinnes 1	824
GBDC	*b.* Artemisia	806
GBDF	*b.* Sonnenfels	881
GBDJ	*b.* Bermuda	811

		PAGE
GBDK	*b.* City of Auckland ..	819
GBDL	*b.* Alster	803
GBDM	*b.* Wolfsburg	894
GBDN	*b.* Heluan	841
GBDP	*b.* City of Valencia ..	820
GBDQ	*b.* City of Alexandria	818
GBDR	*b.* Eduard Woermann	831
GBDS	*b.* Lucie Woermann ..	852
GBDT	*b.* Prinzessin	872
GBDV	*b.* Gertrud GBDV ..	837
GBDW	*b.* City of Palermo ..	819
GBDX	*b.* Crostafels	827
GBDY	*b.* Lorenzo	851
GBDZ	*b.* Eastern Prince ..	831
GBFD	*b.* Almeria	803
GBFD	*b.* Eastminster Abbey	831
GBFJ	*b.* Maimi GBFJ ..	859
GBFK	*b.* City of Harvard ..	819
GBFL	*b.* Gundomar	840
GBFM	*b.* Calypso	815
GBFN	*b.* Maid of Syra ..	853
GBFQ	*b.* Branksome Hall ..	813
GBFR	*b.* Tempestuous ..	885
GBFS	*b.* Gallipoli	836
GBFT	*b.* City of Genoa ..	819
GBFV	*b.* Arafura	805
GBFW	*b.* Tresithney	887
GBFX	*b.* Manchurian ..	855
GBFY	*b.* S. Albans Abbey ..	883
GBJD	*b.* Irmgard	845
GBJF	*b.* Frankfurt	835
GBJK	*b.* Bremen	813
GBJL	*b.* Plum Branch ..	869
GBJM	*b.* Masuria	857
GBJN	*b.* Ravensworth ..	873
GBJP	*b.* Assyria	807
GBJQ	*b.* Rudelsburg.. ..	877
GBJR	*b.* Bretwalda	813
GBJS	*b.* Ehrenfels	831
GBJT	*b.* Delta GBJT ..	828
GBJV	*b.* Aymeric	807
GBJW	*b.* Orteric	866
GBJX	*b.* Tymeric	888
GBJY	*b.* Manordilo	855
GBJZ	*b.* Scotia GBJZ ..	878
GBKC	*b.* Derindje	828
GBKD	*b.* Perim	868
GBKF	*b.* Plata GBKF (La) ..	850
GBKJ	*b.* Wahehe	891
GBKL	*b.* Prinz Ludwig ..	872
GBKM	*b.* Friedrichsruhe ..	835
GBKN	*b.* Montreal GBKN ..	860
GBKP	*b.* Amarapoora ..	803
GBKQ	*b.* Netley Abbey ..	862
GBKR	*b.* Maid of Andros ..	853
GBKS	*b.* Main	853
GBKV	*b.* Pungo	872
GBKW	*b.* Atta..	807
GBKX	*b.* Schwinge	878
GBKY	*b.* Solfels	881
GBKZ	*b.* Schwarzenfels ..	878
GBLC	*b.* Tremere	887
GBLD	*b.* Franziska	835
GBLF	*b.* Konigin Luise ..	849
GBLJ	*b.* Hebe	841
GBLK	*b.* Lady Killiney ..	849
GBLM	*b.* Eirene	831
GBLN	*b.* Gera..	836
GBLP	*b.* Wordsworth ..	894
GBLQ	*b.* S. Augustines Abbey	883
GBLR	*b.* Spezia	881
GBLS	*b.* Pendennis	867
GBLT	*b.* Penpol	868
GBLV	*b.* City of London GBLV	819
GBLV	*b.* Greiffenfels.. ..	839
GBLW	*b.* Wotan GBLW ..	894
GBLX	*b.* Woron	894
GBLZ	*b.* Hornsee	843
GBMC	*b.* Rhenania	874
GBMD	*b.* Cap Polonio ..	816
GBMF	*b.* Royal City ..	876
GBMK	*b.* Prinz Hubertus ..	872
GBML	*b.* Nerbudda	862
GBMN	*b.* Glenluss	837
GBMP	*b.* Antwerpen	805
GBMQ	*b.* Maritime	856
GBMR	*b.* General Napier ..	836
GBMS	*b.* S. Clair	883
GBMT	*b.* Austria	807
GBMV	*b.* Binfield	811
GBMW	*b.* Roma GBMW ..	875
GBMX	*b.* Highlander ..	842
GBMY	*b.* Isis GBMY.. ..	845
GBMZ	*b.* Leapark	850
GBNC	*b.* Baron Garioch ..	809
GBND	*b.* City of Milan ..	819
GBNF	*b.* Sausenburg.. ..	878
GBNJ	*b.* Polo..	869
GBNK	*b.* Emerald	832
GBNL	*b.* S. Andrews ..	883
GBNM	*b.* Waitemata.. ..	891
GBNP	*b.* Grangemouth ..	839
GBNQ	*b.* Cramond	827
GBNR	*b.* Dessau	828
GBNS	*b.* Rialto	874
GBNV	*b.* Galtymore	836
GBNW	*b.* Fulmar	835
GBNX	*b.* Quebec City ..	872
GBNY	*b.* Herman Sauber ..	842
GBNZ	*b.* Mary Horlock ..	857
GBPC	*b.* Uhlenhorst.. ..	889
GBPD	*b.* S. Margaret ..	884
GBPF	*b.* Oehringen	864
GBPJ	*b.* Tremorvah	887
GBPK	*b.* Frankdale	835
GBPM	*b.* Bathurst	809
GBPN	*b.* Maid of Patras ..	853
GBPR	*b.* City of Melbourne..	819
GBPS	*b.* Tasmania	885
GBPT	*b.* Algeria	803
GBPV	*b.* Maid of Tenos ..	853
GBPW	*b.* Sheaf Mount ..	879
GBPX	*b.* Nasmyth	861
GBPY	*b.* Maid of Chios ..	853
GBPZ	*b.* Trewinnard ..	888
GBQC	*b.* Glenade	837
GBQD	*b.* Harvestehude ..	841
GBQF	*b.* Solingen	881
GBQJ	*b.* Haliartus	840
GBQK	*b.* Weissenfelde ..	893
GBQL	*b.* Schwaben	878
GBQM	*b.* Barbadian	808
GBQN	*b.* Admiral Hamilton	802
GBQP	*b.* Wangaratta ..	891
GBQR	*b.* Haresfield	841
GBQS	*b.* Cranfield	827
GBQT	*b.* Severn	879

		PAGE
GCBM	*b.* Bruyere	814
GCBN	*b.* Maindy Priory ..	854
GCBP	*b.* Treverbyn	887
GCBQ	*b.* Maindy House ..	854
GCBR	*b.* Beechpark ..	810
GCBS	*b.* Peshawar	868
GCBT	*b.* S. Bede	883
GCBV	*b.* S. Andrew GCBV ..	883
GCBW	*b.* Goalpara	838
GCBX	*b.* Harmodius ..	841
GCBY	*b.* Montrose	860
GCBZ	*b.* Backworth	807
GCDB	*b.* Coatsworth ..	825
GCDF	*b.* Umtata	889
GCDJ	*b.* Umbloti	889
GCDK	*b.* Shahristan	879
GCDL	*b.* Hornchurch ..	843
GCDM	*b.* Louisiana GCDM ..	852
GCDN	*b.* Housatonic GCDN	843
GCDP	*b.* Gharinda	837
GCDQ	*b.* Dagenham	827
GCDR	*b.* Admiral Hastings	802
GCDS	*b.* S. Rognvald ..	884
GCDT	*b.* Kapurthala ..	847
GCDV	*b.* Sambre	877
GCDW	*b.* Sarthe	877
GCDX	*b.* Tregenna	887
GCDY	*b.* Kaiwarra	659
GCDY	*b.* Kaiwarra	847
GCDZ	*b.* Hunstanworth ..	843
GCED	*b.* Shearwater ..	673
GCFB	*b.* Ben Voilich ..	811
GCFD	*b.* Onega	865
GCFJ	*b.* Port Curtis ..	870
GCFK	*b.* Woodarra	894
GCJP	*b.* Henri Deutsch de la Meurthe	841
GCJQ	*b.* Fort Hamilton ..	835
GCJR	*b.* Zeppelin GCJR ..	895
GCKB	*b.* Ciscar	818
GCKD	*b.* Colon	825
GCKF	*b.* Arana	805
GCKJ	*b.* Almagro	803
GCKL	*b.* Alvarado	803
GCKM	*b.* Canonesa	815
GCKN	*b.* Easterly	831
GCKP	*b.* Golconda	838
GCKR	*b.* Lancaster Castle ..	849
GCKS	*b.* Neotsfield	862
GCKT	*b.* Hazelside	841
GCKV	*b.* Trelyon	887
GCKW	*b.* Harmonides ..	841
GCKX	*b.* Halizones	840
GCKY	*b.* Knockfierna ..	849
GCLB	*b.* Gogra	838
GCLD	*b.* Gorala	838
GCLF	*b.* Nardana	861
GCLJ	*b.* Kastalia	847
GCLK	*b.* Fallsmead	834
GCLM	*b.* Glenariffe	837
GCLN	*b.* Otaki	866
GCLQ	*b.* S. Sunniva ..	884
GCLR	*b.* Curraghmore ..	827
GCLS	*b.* Ronalee	875
GCLT	*b.* Keelung	847
GCLV	*b.* New Toronto ..	863
GCLW	*b.* New Texas.. ..	862
GCLX	*b.* Halo GCLX ..	840
GCLY	*b.* Mateba	857

		PAGE
GCLZ	*b.* Montazah ..	860
GCMB	*b.* Mahmoudieh ..	853
GCMD	*b.* Monassir	859
GCMF	*b.* Matama	857
GCMJ	*b.* Philadelphian ..	869
GCMK	*b.* Anglia GCMK ..	804
GCML	*b.* Hibernia	842
GCMN	*b.* Gondia	838
GCMP	*b.* Hallside	840
GCMQ	*b.* River Dare ..	875
GCMR	*b.* Gandara	836
GCMS	*b.* Garada	836
GCMT	*b.* Cyprian Prince ..	827
GCMV	*b.* Trekieve	887
GCMW	*b.* Trewyn	888
GCMX	*b.* King Alfred ..	848
GCMY	*b.* Algerian Prince ..	803
GCMZ	*b.* Sunpath	882
GCNB	*b.* Bolivian	812
GCND	*b.* Applebranch ..	805
GCNF	*b.* Kara	847
GCNJ	*b.* Pinar del Rio ..	869
GCNK	*b.* Riposto	875
GCNL	*b.* Emlynian ..	832
GCNM	*b.* Belgian	810
CGNP	*b.* Somerton	881
GCNQ	*b.* Port Kembla ..	871
GCNR	*b.* Port Adelaide ..	870
GCNS	*b.* Natia	861
GCNT	*b.* Nariva	861
GCNV	*b.* Prinz Friedrich Wilhelm	872
GCNW	*b.* Grangepark ..	839
GCNX	*b.* Lord Guildford ..	851
GCNY	*b.* Waikawa	661
GCNY	*b.* Waikawa	891
GCNZ	*b.* Danier	828
GCPB	*b.* Turcoman	888
GCPD	*b.* Welshman	893
GCPF	*b.* City of Bristol ..	819
GCPJ	*b.* City of Benares ..	819
GCPK	*b.* City of Calcutta ..	819
GCPL	*b.* Hymettus	844
GCPM	*b.* Katuna	847
GCPN	*b.* Kabinga	846
GCPQ	*b.* Surat	882
GCPR	*b.* Kathiawar	847
GCPS	*b.* City of Lahore ..	819
GCPT	*b.* City of Naples	819
GCPV	*b.* Valiant	889
GCPW	*b.* City of Durham ..	819
GCPX	*b.* City of London ..	819
GCPY	*b.* City of Marseilles..	819
GCPZ	*b.* Bronte GCPZ ..	814
GCQB	*b.* Balfe	808
GCQD	*b.* Ismaila	845
GCQJ	*b.* Itola	845
GCQK	*b.* Agadir GCQK ..	802
GCQL	*b.* Beacon Grange ..	810
GCQP	*b.* Buccinum	814
GCQR	*b.* Angora	804
GCQS	*b.* Appalachee GCQS..	805
GCQT	*b.* Arankola GCQT ..	805
GCQV	*b.* Arlanza	806
GCQW	*b.* Arzila	806
GCQX	*b.* Berwindvale ..	811
GCQY	*b.* Gambhira	836
GCQZ	*b.* Braemar Castle ..	813
GCRB	*b.* Britannia GCRB ..	813

Call	Station	PAGE
GDBS	*b.* Moto	860
GDBV	*b.* Montgomeryshire	860
GDBW	*b.* Nagpore	861
GDBX	*b.* Kidderpore	848
GDBY	*b.* Jeypore	846
GDBZ	*b.* Lahore	849
GDCB	*b.* Alipore	803
GDCF	*b.* Glassford	837
GDCJ	*b.* Speedonia	881
GDCK	*b.* Maine GDCK	854
GDCL	*b.* Knebworth	848
GDCM	*b.* Dalworth	828
GDCN	*b.* Glenomera	837
GDCP	*b.* Unda	889
GDCR	*b.* New Brighton	862
GDCS	*b.* New Columbia	862
GDCT	*b.* Chirripo	818
GDCV	*b.* Reventazan	874
GDCW	*b.* Zent	895
GDCX	*b.* Manistee	855
GDCY	*b.* Patia	867
GDCZ	*b.* Tortuguero	887
GDFC	*b.* Cano	815
GDFJ	*b.* Arta	806
GDFK	*b.* Altona	803
GDFL	*b.* Clara Zelck	824
GDFN	*b.* Ina Blumenthal	844
GDFP	*b.* Martha Russ	857
GDFQ	*b.* Mecklenburg GDFQ	857
GDFR	*b.* Vogtland	891
GDFS	*b.* Lemberg	850
GDFT	*b.* Venosta	890
GDFV	*b.* Antwerp	805
GDFW	*b.* Cordale	825
GDFX	*b.* Ave Maria	807
GDFY	*b.* Anhalt	804
GDFZ	*b.* Knight Errant	848
GDJB	*b.* Rochelie	875
GDJK	*b.* Gerano	836
GDJQ	*b.* Cutty Sark	827
GDJR	*b.* Corpath	826
GDJV	*b.* Fernhill	834
GDJW	*b.* Zinal	890
GDJX	*b.* Maindy Bridge	854
GDJY	*b.* Julius Zelck	846
GDKB	*b.* Dorsetshire	829
GDKC	*b.* Yorkshire	895
GDKF	*b.* Ansgir	804
GDKL	*b.* Clyne Rock	825
GDKL	*b.* Franz Dahl	835
GDKM	*b.* Stolberg	882
GDKN	*b.* Homecliffe	843
GDKP	*b.* Friesland GDKP	835
GDKQ	*b.* Geierfels	836
GDKS	*b.* Marie Reppell	856
GDKT	*b.* Maid of Corfu	853
GDKW	*b.* Hesperia	842
GDKX	*b.* Thornbury	886
GDKY	*b.* Sauerland	877
GDKZ	*b.* D.A.D.G. 76	827
GDLB	*b.* Baltabor	808
GDLC	*b.* General Milne	836
GDLF	*b.* Cooee GDLF	825
GDLK	*b.* Wray Castle	894
GDLM	*b.* Porthia	871
GDLP	*b.* Oropesa	865
GDLQ	*b.* La Paz	850
GDLR	*b.* Hesperides GDLR	842
GDLS	*b.* Frieda Fahrenheim	835
GDLT	*b.* Vikingstar	890
GDLV	*b.* Albania GDLV	803
GDLW	*b.* Black Sea	811
GDLX	*b.* Singleton Abbey	880
GDLZ	*b.* Kendal Castle	847
GDMC	*b.* Norwegian	864
GDMF	*b.* Elmpark	832
GDMJ	*b.* Accrington	862
GDMK	*b.* Lolworth	851
GDML	*b.* Bristol City	813
GDMN	*b.* Ekari	831
GDMP	*b.* Corrientes	826
GDMQ	*b.* War Pindari	892
GDMR	*b.* Antinoe	805
GDMS	*b.* Mashobra	857
GDMT	*b.* Mundra	861
GDMV	*b.* Domala	829
GDMW	*b.* Manela	855
GDMX	*b.* Madura	853
GDMY	*b.* Mantola	855
GDMZ	*b.* Matdana	857
GDNB	*b.* Malda	854
GDNC	*b.* Chantala	817
GDNF	*b.* Dumana	830
GDNJ	*b.* Chilka	818
GDNK	*b.* Dacre Hill	827
GDNL	*b.* Vaux	890
GDNM	*b.* Firpark	834
GDNP	*b.* Venetia GDNP	890
GDNQ	*b.* Sirsa	880
GDNR	*b.* Surada	882
GDNS	*b.* Cavallo	817
GDNT	*b.* Destro	828
GDNV	*b.* Guido	840
GDNW	*b.* Runo	877
GDNX	*b.* City of Brisbane	819
GDNY	*b.* Egyptian	831
GDNZ	*b.* Palmella	866
GDPB	*b.* New Brooklyn	862
GDPC	*b.* Indian City	845
GDPF	*b.* Andalusier	804
GDPJ	*b.* Edavana	831
GDPK	*b.* Estrellano	833
GDPL	*b.* Greylight	830
GDPM	*b.* Ashworth	806
GDPN	*b.* Ardena	805
GDPQ	*b.* Cleopatra III	825
GDPR	*b.* King Lear	848
GDPS	*b.* Machaon	853
GDPT	*b.* Calchas	815
GDPV	*b.* Clan Mac Taggart	823
GDPW	*b.* Clan Mac Tavish	823
GDPX	*b.* City of Adelaide	818
GDPY	*b.* Sandon Hall	877
GDPZ	*b.* Maimoa	853
GDQB	*b.* Middlesex GDQB	859
GDQC	*b.* Balderton	807
GDQF	*b.* Cromerton	827
GDQJ	*b.* Lady Denison Pender	849
GDQK	*b.* Ronda	875
GDQL	*b.* Lys	853
GDQM	*b.* Cornwall	826
GDQN	*b.* Lalande	849
GDQP	*b.* Hogarth	843
GDQR	*b.* Albion	803
GDQS	*b.* Evesham	833
GDQT	*b.* H. H. Asquith	842
GDQV	*b.* Elswick Park	832
GDQW	*b.* Glenogle	837

		PAGE
GDQX	*b.* Princess Ena GDQX	872
GDQY	*b.* Ardenza	805
GDQZ	*b.* Sobo	880
GDRB	*b.* Tynedale	889
GDRC	*b.* William Carberry	893
GDRK	*b.* Cordillera	826
GDRL	*b.* Filey	834
GDRM	*b.* Jersey City	846
GDRN	*b.* Atlantic City	807
GDRP	*b.* Paris City	867
GDRS	*b.* City of Glasgow	819
GDRT	*b.* Arbonne	805
GDRV	*b.* Cambria GDRV	815
GDRW	*b.* Scotia GDRW	878
GDRX	*b.* Diadem	829
GDRY	*b.* Thomas Crofton	886
GDRZ	*b.* John Casewell	846
GDSB	*b.* Boston City	812
GDSC	*b.* Olavus	864
GDSF	*b.* Dromore	830
GDSJ	*b.* City of Pekin	819
GDSK	*b.* Kincardine	848
GDSL	*b.* Everest	833
GDSM	*b.* Scottish American	878
GDSN	*b.* City of Durban	819
GDSP	*b.* Azeus	807
GDSQ	*b.* Drujba	830
GDSR	*b.* Produgol	872
GDST	*b.* Cranford GDST	827
GDSV	*b.* Oriflamme GDSV	865
GDSW	*b.* Aba	801
GDSX	*b.* Madame Midas	853
GDSY	*b.* Cedarmore	817
GDSZ	*b.* Gaslight	836
GDTB	*b.* Whitemantle	893
GDTC	*b.* British Coast	813
GDTF	*b.* Western Coast	893
GDTJ	*b.* Alness	803
GDTK	*b.* Braywood	813
GDTL	*b.* Lisbon	851
GDTM	*b.* Dido GDTM	829
GDTN	*b.* Vulture	891
GDTP	*b.* Magpie	853
GDTQ	*b.* Hound	843
GDTR	*b.* Pointer	869
GDTS	*b.* Partridge GDTS	867
GDTV	*b.* Puma	872
GDTV	*b.* Woodcock GDTV	894
GDTW	*b.* Moorfowl	860
GDTX	*b.* Tiger GDTX	886
GDTZ	*b.* Spaniel	881
GDVB	*b.* Rowan GDVB	876
GDVC	*b.* Olive	864
GDVF	*b.* Thistle GDVF	886
GDVJ	*b.* Brier	813
GDVK	*b.* Inverleith	845
GDVL	*b.* Bandon	808
GDVM	*b.* Moorfoot	860
GDVN	*b.* Melford Hall	858
GDVP	*b.* Incemore	844
GDVQ	*b.* Shahzada	879
GDVR	*b.* Maharaja	853
GDVS	*b.* Shahjehan	879
GDVT	*b.* Retriever GDVT	874
GDVW	*b.* Vanellus	889
GDVX	*b.* Ethel Radcliffe	833
GDVY	*b.* Dramatist	829
GDVZ	*b.* Moldavia	859
GDWB	*b.* Gloxinia	838
GDWC	*b.* Wendland	893
GDWF	*b.* Sheaf Arrow	879
GDWJ	*b.* Bruges	814
GDWK	*b.* Baychino	809
GDWL	*b.* Anchorton	804
GDWM	*b.* Baltannic	808
GDWN	*b.* Glentworth	838
GDWP	*b.* Trebartha	887
GDWQ	*b.* Tredennick	887
GDWR	*b.* Trevorian	888
GDWS	*b.* Silverlight	880
GDWT	*b.* S. Bruno	883
GDWX	*b.* Alice Marie	803
GDWY	*b.* Mostyn	860
GDWZ	*b.* Spero	881
GDXC	*b.* Baltriger	808
GDXF	*b.* Constantin	825
GDXK	*b.* Baltamar	808
GDXL	*b.* Lobos	851
GDXM	*b.* Losada	852
GDXN	*b.* Clan Macindoe	821
CDXP	*b.* S. Gil	883
GDXQ	*b.* Seaham Harbour	878
GDXR	*b.* Pays de Waes	867
GDXS	*b.* Cameronia	815
GDXT	*b.* Glenapp	837
GDXV	*b.* Wrangler	894
GDXW	*b.* Rotherhill	876
GDXY	*b.* Chow Tai	818
GDXZ	*b.* Magdapur	853
GDYB	*b.* Spanker	881
GDYC	*b.* Ford Castle	835
GDYF	*b.* Neath Abbey	862
GDYJ	*b.* George Ward	836
GDYK	*b.* Oswestry	866
GDYL	*b.* Ruthenia	877
GDYN	*b.* Longhirst	851
GDYP	*b.* Scythia	878
GDYT	*b.* S. Tiburcio	884
GDYV	*b.* Malia	854
GDYW	*b.* Eumaeus	833
GDYX	*b.* Mayari	857
GDYZ	*b.* Glaucus	837
GDZB	*b.* Troilus	888
GDZF	*b.* Inkum	845
GDZJ	*b.* Pear Branch	867
GDZK	*b.* S. Leon	884
GDZM	*b.* Withernsea	894
GDZN	*b.* Flamborough	834
GDZP	*b.* Somersetshire	881
GDZQ	*b.* Lombardy	851
GDZR	*b.* Atua	807
GDZS	*b.* Kurow	849
GDZT	*b.* Maheno	853
GDZV	*b.* Makura	854
GDZW	*b.* Manuka	856
GDZX	*b.* Maori	856
GDZY	*b.* Marama	856
GFBC	*b.* Mooltan	860
GFBD	*b.* Maloja	854
GFBJ	*b.* Mongolia GFBJ	860
GFBK	*b.* Mirzapore	859
GFBL	*b.* Ballarat	808
GFBM	*b.* Balranald	808
GFBN	*b.* Baradine	808
GFBP	*b.* Barrabool	809
GFBQ	*b.* Bendigo	810
GFBR	*b.* Lady Kerry	849
GFBS	*b.* Lady Wicklow	849

		PAGE
GFBT	*b.* Glanbrydan	837
GFBV	*b.* Lutterworth	852
GFBW	*b.* Sandown Castle	877
GFBX	*b.* Douglas GFBX	829
GFBY	*b.* Mona	859
GFBZ	*b.* Fenella	834
GFCB	*b.* Avontown	807
GFCD	*b.* Bearwood	810
GFCJ	*b.* Cornwood	826
GFCK	*b.* Portwood	871
GFCL	*b.* City of Cambridge	819
GFCM	*b.* Lady Carlow	849
GFCN	*b.* Breslau	813
GFCP	*b.* Coblenz	825
GFCQ	*b.* Weimar	893
GFCR	*b.* Rowanpark	876
GFCS	*b.* Melrose GFCS	858
GFCT	*b.* Corland	826
GFCV	*b.* Bompata	812
GFCW	*b.* Ardmore	805
GFCX	*b.* Kenmare GFCX	848
GFCY	*b.* Dakarian	827
GFCZ	*b.* Hurunui	844
GFDB	*b.* British Colonel	813
GFDC	*b.* Orlock Head	865
GFDJ	*b.* Coronaldo	826
GFDK	*b.* S. Gertrudis	883
GFDM	*b.* Athenia	867
GFDN	*b.* Letitia	850
GFDP	*b.* Cortona	826
GFDQ	*b.* Carmia	816
GFDR	*b.* Gracia	839
GFDS	*b.* Lorettia	851
GFDT	*b.* Hornbill	843
GFDW	*b.* Lancastrian Prince	849
GFDX	*b.* Matakana	857
GFDY	*b.* British Viscount	814
GFDZ	*b.* Modasa	859
GFJB	*b.* Eastney	831
GFJC	*b.* Fred Cleeves	835
GFJD	*b.* Nirpura	863
GFJK	*b.* Jessmore	846
GFJL	*b.* War Fig	892
GFJM	*b.* Inston	845
GFJN	*b.* Borulos	812
GFJP	*b.* Dakahlieh	827
GFJQ	*b.* Mansourah GFJQ	855
GFJR	*b.* Ringdove	874
GFJS	*b.* Pittsburgh GFJS	869
GFJT	*b.* Calgary	815
GFJV	*b.* Yarrow	895
GFJW	*b.* Myrtlepark	861
GFJX	*b.* Ibicuhy	844
GFJZ	*b.* S. Felix	883
GFKB	*b.* S. Teodoro	884
GFKC	*b.* S. Lamberto	884
GFKL	*b.* S. Ubaldo	884
GFKM	*b.* S. Ugon	884
GFKV	*b.* Ting Sang	886
GFKW	*b.* Kut Sang	849
GFKX	*b.* Fau Sang	834
GFKY	*b.* Disona	829
GFKZ	*b.* Scalfaria	878
GFLB	*b.* Spirila	881
GFLC	*b.* Solen	881
GFLD	*b.* Saxicava	878
GFLJ	*b.* Limnea	851
GFLK	*b.* Radix	873
GFLM	*b.* Paludina	867
GFLN	*b.* Petricola	868
GFLP	*b.* Planorbis	869
GFLQ	*b.* Pleiodon	869
GFLR	*b.* Nassa	861
GFLS	*b.* Nobia	863
GFLV	*b.* Ribera	874
GFLW	*b.* Ballycotton	868
GFLX	*b.* Goodwin	838
GFLY	*b.* Lizard	851
GFLZ	*b.* Longships	851
GFMB	*b.* Pladda	869
GFMC	*b.* Rathlin	873
GFMD	*b.* Saltees	877
GFMJ	*b.* Sheerness	879
GFMK	*b.* Skerryvore	880
GFML	*b.* Seminole GFML	879
GFMN	*b.* Robert Dollar	875
GFMP	*b.* Orowaiti	865
GFMQ	*b.* Semper Paratus	879
GFMR	*b.* Borde	812
GFMS	*b.* Windsor Castle	894
GFMT	*b.* Lothar Bohlen	852
GFMV	*b.* City of Christiania	819
GFMW	*b.* City of Tokio	820
GFMX	*b.* Hazelpark	841
GFMY	*b.* Heathpark	841
GFMZ	*b.* Laurelpark	850
GFNB	*b.* Dakotian	827
GFNC	*b.* Vandyck	889
GFND	*b.* Voltaire	891
GFNJ	*b.* Moyle	861
GFNK	*b.* Clan Macnair	823
GFNL	*b.* Shelley	879
GFNM	*b.* Devonia	829
GFNP	*b.* Britannia GFNP	813
GFNQ	*b.* Cambria GFNQ	815
GFNR	*b.* Ravenswood	873
GFNS	*b.* Glen Usk	838
GFNT	*b.* Glen Gower	837
GFNV	*b.* Dunara Castle	830
GFNW	*b.* Maid of Delos	853
GFNX	*b.* Maid of Crete	853
GFNY	*b.* Nuthatch	864
GFNZ	*b.* Everton	833
GFPB	*b.* Acardo	802
GFPC	*b.* Amalthus	803
GFPD	*b.* Achatina	802
GFPJ	*b.* Ampullaria	804
GFPK	*b.* S. Gaspar	883
GFPL	*b.* Willowpark	893
GFPM	*b.* Emil Georg v Stauss	832
GFPN	*b.* Mona's Isle	859
GFPR	*b.* Claymore GFPR	824
GFPS	*b.* Manxman GFPS	856
GFPT	*b.* Glendun	837
GFPV	*b.* Mona's Queen	859
GFPW	*b.* Tynwald	889
GFPY	*b.* Clan Maciver	822
GFPZ	*b.* Greyhound	839
GFQB	*b.* Draco	829
GFQC	*b.* Gitano	837
GFQD	*b.* Hardwicke Grange	841
GFQJ	*b.* Pencarrow	867
GFQK	*b.* Keats	847
GFQL	*b.* British Tommy	814
GFQM	*b.* City of Paris	819
GFQN	*b.* City of Simla	820
GFQP	*b.* Balmoral	808
GFQR	*b.* Dalewood	828

		PAGE
GFQS	*b.* Manoa	855
GFUR	*b.* Victoria and Albert	890
GFYB	*b.* Maunganui	857
GFYC	*b.* Moana	859
GFYD	*b.* Moeraki	859
GFYJ	*b.* Mokoia	859
GFYK	*b.* Navua	862
GFYL	*b.* Taviuni	885
GFYM	*b.* Tofua	886
GFYN	*b.* Wahine	891
GFYP	*b.* Waihora	891
GFYR	*b.* Haim Mazza ..	840
GFYT	*b.* Macabi	853
GFYV	*b.* Brynymor	814
GFYW	*b.* Umfuli	889
HG	*c.* Hamburg	598
HS	*c.* Uccle, Brussels ..	570
HW	*c.* Hanover	598
HCE	*c.* Esmeraldas.. ..	589
HCG	*c.* Guayaquil	589
HDA	*b.* Mizar	721
HDB	*b.* Aldebaran HDB ..	715
HDC	*b.* Alioth	715
HDD	*b.* Aderamin ..	715
HDD	*b.* Alderamin	715
HDG	*b.* Lingedyk	721
HDH	*b.* Zaandyk HDH ..	727
HDK	*b.* Noord	722
HDL	*b.* Rijn	723
HDR	*b.* Vechtdijk HDR ..	726
HDZ	*b.* Schelde HDZ ..	724
HEA	*b.* Overijsel	723
HEB	*b.* Groningen	718
HEC	*b.* Jacob van Heemskerck HEC ..	719
HED	*b.* Willem Barentsz ..	727
HEJ	*b.* Jagersfontein ...	719
HEK	*b.* Randfontein ..	723
HEM	*b.* Marsdiep	721
HEO	*b.* Orion HEO ..	723
HEP	*b.* Venus HEP ..	727
HES	*b.* Beverwijk	716
HEV	*b.* Vredenburg ..	727
HEZ	*b.* Domburg	717
HFB	*c.* Belgrade	607
HFC	*c.* Sarajevo	607
HFS	*c.* Skoplja	608
HGA	*c.* Bangkok	625
HGB	*c.* Singora	625
HGC	*b.* Bali HGC	781
HGD	*b.* Sua Tavanchol ..	781
HGE	*b.* Sua Kamrensindhu	781
HIB	*c.* La Romana ..	624
HJB	*c.* Puerto Colombia ..	584
HLA	*b.* Cabo Ortegal ..	783
HLB	*b.* Basconia	783
HLC	*b.* Cirilo Amoros ..	784
HLD	*b.* El Gallo	785
HLE	*b.* Iturri-Ederra ..	786
HLF	*b.* Roger de Flor ..	789
HLG	*b.* Iturri-Gorri ..	786
HLH	*b.* Agustina Forner ..	781
HLI	*b.* Ibaizabal	785
HLJ	*b.* Juan Maragall ..	786
HLK	*b.* Tordera	790
HLL	*b.* Cabo Villano ..	783
HLM	*b.* M. Arnus	787
HLN	*b.* Begonia No. 1 ..	783
HLO	*b.* Peris Valero ..	788
HLP	*b.* Paulina	788
HLQ	*b.* Begonia No. 2 ..	783
HLR	*b.* Rita HLR	789
HLS	*b.* Serra	789
HLT	*b.* Marques Del Turia ..	787
HLU	*b.* Cabo Espartel ..	783
HLV	*b.* Salvadora .. .	789
HLW	*b.* Marques de Chavarri	787
HLX	*b.* Begonia No. 3 ..	783
HLY	*b.* Progreso	788
HLZ	*b.* Ampurdan	782
HMA	*b.* Concha	784
HMB	*b.* Mirentxu	787
HMC	*b.* Bilbanio	783
HMD	*b.* Cresalubi	784
HME	*b.* Velarde	791
HMF	*b.* Aizkori Mendi ..	781
HMG	*b.* Capitan Segarra ..	783
HMH	*b.* Andraka Mendi ..	782
HMI	*b.* Arnabal Mendi ..	782
HMJ	*b.* Arantzazu	782
HMK	*b.* Astondo Mendi ..	782
HML	*b.* Macarena	787
HMM	*b.* Fernando L. de Ibarra	785
HMN	*b.* Biskargi Mendi ..	783
HMO	*b.* Eretza Mendi ..	785
HMP	*b.* Gorbea Mendi ..	785
HMQ	*b.* Igotz Mendi ..	785
HMR	*b.* Iluntzar Mendi ..	785
HMS	*b.* Jata Mendi ..	786
HMT	*b.* Ordunte Mendi ..	788
HMU	*b.* Armuru	782
HMU	*b.* Eusebia del Valle ..	785
HMV	*b.* Unbe Mendi ..	791
HMW	*b.* Upo Mendi ..	791
HMX	*b.* Urkiola Mendi ..	791
HMY	*b.* Urko Mendi ..	791
HMZ	*b.* Ibai Paxto	785
HMZ	*b.* Iturri-Paxto ..	786
HNA	*b.* Rita HNA	789
HNB	*b.* Achuri	781
HNC	*b.* Arnus	782
HND	*b.* Sendeja	789
HNE	*b.* Begonia No. 5 ..	783
HNF	*b.* Villa Manrique ..	791
HNG	*b.* Villa Sandino ..	791
HNH	*b.* Tirso HNH	790
HNI	*b.* Azpeitia	783
HNJ	*b.* Donastia	784
HNK	*b.* Wenceslao	791
HNL	*b.* Trini	790
HNM	*b.* Penalba	788
HNN	*b.* Cabo Socratif ..	783
HNO	*b.* Aviles	783
HNP	*b.* Tintoré	790
HNQ	*b.* Capita Revuelta ..	783
HNR	*b.* José Taya	786
HNS	*b.* Anorga	782
HNT	*b.* Pax	788
HNV	*c.* Port Vila	595
HRE	*c.* Caracas	653
HRF	*c.* Maracay	653
HRG	*c.* San Christobal, Venezuela..	654
HRH	*c.* La Guayra ..	653
HRI	*c.* Maracaybo ..	653
HRK	*c.* Puerto Cabello ..	654

		PAGE
HTD	*b.* Andree	684
HWM	*c.* Médiouna	611
HZA	*c.* Cayenne	594
HOJF	*b.* Defenders	920
IAA	*b.* Ada O	729
IAB	*b.* Albaro	730
IAC	*b.* Ansaldo 6	731
IAE	*b.* Pilsna	737
IAF	*b.* Brenta	731
IAH	*b.* Ansaldo S. Georgio 2	731
IAI	*b.* Ansaldo S. Georgio 3	731
IAJ	*b.* Fiume	734
IAK	*b.* Citta di Cagliari	732
IAL	*b.* Rosolino Orlando	738
IAM	*b.* Ferdinando Palasciano	734
IAP	*b.* Angelo Bondi	730
IAR	*b.* Attualita	731
IAS	*b.* Vittoria	739
IAW	*b.* Bengasi 2	731
IAX	*b.* Derna	733
IAZ	*b.* Africa	730
ICA	*c.* Aspio Radio	603
ICB	*c.* Genova Radio	604
ICC	*c.* Cagliari Radio	603
ICD	*c.* Centocelle	603
ICD	*c.* Roma Centocelle	605
ICE	*c.* Brindisi Radio	603
ICF	*c.* Messina Radio	604
ICG	*c.* Pantelleria	605
ICH	*c.* Maddalena Radio	604
ICI	*c.* Guglielmo Marconi	604
ICI	*c.* Coltano	604
ICJ	*c.* Bengasi Radio	586
ICK	*c.* Tripoli Radio	630
ICM	*c.* Centopozzi Radio	604
ICN	*c.* Napoli Radio	605
ICO	*c.* Derna Radio	586
ICP	*c.* Palermo Radio	605
ICQ	*c.* S. Cataldo Bari	605
ICR	*c.* Capo Sperone Radio	603
ICS	*c.* Spezia	605
ICT	*c.* Taranto	605
ICV	*c.* Vittoria Radio	606
ICU	*c.* Tobruk Radio	586
ICW	*c.* Asmara	589
ICW	*c.* Rodi	588
ICX	*c.* Massaua ICX	590
ICY	*c.* Assab Radio	589
ICZ	*c.* Venezia Radio	605
IDA	*c.* Stampalia	588
IDB	*c.* Saseno Radio	605
IDD	*c.* Lipari	604
IDE	*c.* Stromboli Radio	605
IDG	*c.* Otranto Radio	605
IDH	*c.* Cotrone Radio	604
IDK	*c.* Livorno Radio	604
IDL	*c.* Civitavecchia Radio	604
IDM	*c.* Arta Radio	603
IDO	*c.* Rome (S. Paolo)	605
IDP	*c.* Marsala Radio	604
IDR	*c.* Tempio	605
IDS	*c.* Ustica	605
IEA	*b.* S. Giorgio IEA	738
IEB	*b.* Monte Grappa	736
IEC	*b.* S. Giovanni	738
IED	*b.* Brasile	731
IEE	*b.* Europa IEE	733
IEF	*b.* Città di Venezia	732
IEG	*b.* Rovereto	738
IEH	*b.* Savoia IEH	738
IEI	*b.* Luciano Manara	735
IEJ	*b.* Gerolamo Ulloa	734
IEK	*b.* S. Giuseppe	738
IEL	*b.* Piave IEL	737
IEN	*b.* Atlanta	731
IEO	*b.* Adriatico	730
IEP	*b.* Milazzo	736
IEQ	*b.* Volturno	739
IES	*b.* Città di Siracusa	732
IET	*b.* Città di Catania	732
IEU	*b.* Solunto	739
IEV	*b.* Posillipo	737
IEW	*b.* Masaniello	736
IEX	*b.* Lepanto	735
IEY	*b.* Dinnamare	733
IEZ	*b.* Sicania	738
IFA	*b.* A. Poerlo	731
IFB	*b.* G. Pepe	735
IFD	*b.* C. Mirabello	733
IFE	*b.* C. A. Racchia	732
IFF	*b.* A. Riboty	731
IFH	*b.* Anteo	731
IFI	*b.* Lete	735
IFJ	*b.* Cocito	733
IFK	*b.* Flegetonte	734
IFL	*b.* Stige	739
IFM	*c.* Messina	604
IFN	*b.* E. Carlotto	733
IFO	*b.* Tevere	739
IFP	*b.* Acerbi	729
IFQ	*b.* Cunfida	733
IFR	*c.* Reggio Calabria	605
IFS	*b.* Orsini V	737
IFV	*c.* Villa San Giovanni	605
IFW	*b.* Balena	731
IFX	*b.* Acheronte	729
IFY	*b.* Titano	739
IFZ	*b.* Tremiti	739
IGA	*b.* Bronte IGA	731
IGB	*c.* Bologna	603
IGC	*b.* Trinacria	739
IGD	*b.* Giovanni Bausan	734
IGE	*b.* Flavio Gioia	734
IGF	*b.* Archimede	731
IGG	*b.* Americo Vespucci	730
IGH	*b.* Garigliano	734
IGI	*b.* Bengasi	731
IGJ	*b.* Città di Milano	732
IGJ	*b.* Cortellazzo	733
IGK	*b.* Cirenaica	732
IGK	*b.* Sterope	739
IGL	*b.* Vulcano IGL	739
IGM	*c.* Milano	604
IGN	*b.* Giuliana	734
IGO	*b.* Eridano	733
IGP	*b.* Misurata	736
IGQ	*b.* Ciclope	732
IGR	*b.* Ammiraglio Magnaghi	730
IGS	*b.* Capitano Verri	732
IGT	*c.* Torino	605
IGU	*b.* Zenson	740
IGU	*b.* Carlo Alberto	732
IGV	*b.* S. Giorgio II	738
IGV	*c.* Treviso	605
IGX	*b.* Eritrea	733

		PAGE
IGY	*b.* Marco Pola ..	735
IGZ	*b.* Sebastiano Caboto	738
IHA	*b.* Andrea Doria ..	730
IHB	*b.* Duilio	733
IHC	*b.* Dante Alighieri IHC	733
IHD	*b.* Conte di Cavour ..	733
IHE	*b.* Giulio Cesare IHE	734
IHF	*b.* Vettor Pisani ..	739
IHG	*b.* Italia IHG ..	735
IHH	*b.* Dandolo	733
IHK	*b.* Re Umberto ..	737
IHL	*b.* Sicilia IHL ..	738
IHM	*b.* Sardegna IHM ..	738
IHN	*b.* Vittorio Emanuele	739
IHO	*b.* Napoli	736
IHP	*b.* Roma IHP ..	738
IHQ	*b.* Regina Elena ..	739
IHR	*b.* Pisa	737
IHT	*b.* S. Marco	738
IHU	*b.* S. Giorgio IHU ..	738
IHV	*b.* Ammiraglio Di Saint Bon	730
IHW	*b.* Emanuele Filiberto	733
IHX	*b.* Ercole	733
IHY	*b.* Varese	739
IHZ	*b.* Francesco Ferruccio	734
IIA	*b.* Ardito	731
IIB	*b.* Ardente	731
IIC	*b.* Audace	731
IID	*b.* Animoso	730
IIE	*b.* Alpino	730
IIF	*b.* Giannutri	734
IIG	*b.* Artigliere	731
IIH	*b.* Bersagliere	731
III	*b.* Borea	731
IIJ	*b.* Carabiniere.. ..	732
IIK	*b.* Corazziere	733
IIL	*b.* Dardo	733
IIM	*b.* Espero	733
IIN	*b.* Euro	733
IIO	*b.* Fuciliere	734
IIP	*b.* Fulmine	734
IIQ	*b.* Garibaldino ..	734
IIR	*b.* Granatiere	735
IIS	*b.* Indomito	735
IIT	*b.* Insidioso	735
IIU	*b.* Intrepido	735
IIV	*b.* Impavido	735
IIW	*b.* Aquilone	731
IIX	*b.* Irrequieto	735
IIY	*b.* Lampo IIY ..	735
IIZ	*b.* Lanciere	735
IJA	*b.* Nembo	736
IJB	*b.* Ostro	737
IJC	*b.* Pontiere	737
IJD	*b.* Strale	739
IJE	*b.* Zeffiro	740
IJF	*b.* Ascaro	731
IJG	*b.* F. Nullo	734
IJH	*b.* A. Mosto	730
IJI	*b.* Europa IJI ..	733
IJJ	*b.* R. Pilo	738
IJK	*b.* G. Abba	734
IJL	*b.* I. Nievo	735
IJM	*b.* S. Schiaffino ..	739
IJN	*b.* P. Bronzetti ..	737
IJO	*b.* G. Missori	735
IJP	*b.* Aquila	731
IJQ	*b.* Sirtori	739
IJR	*b.* Nibbio	736
IJS	*b.* Sparviero	739
IJT	*b.* Falco	733
IJU	*b.* F. Stocco	734
IJV	*b.* G. La Masa ..	735
IJW	*b.* G. Carini	734
IJX	*b.* Bertani	731
IJZ	*b.* N. Fabrizi	736
IKA	*b.* Tobruk	739
IKB	*b.* Medici	736
IKC	*b.* Prometeo	737
IKD	*b.* Quarto	737
IKE	*b.* Marsala	735
IKF	*b.* Nino Bixio	737
IKG	*b.* Etna IKG	733
IKH	*b.* Libia	735
IKI	*b.* Elba IKI	733
IKJ	*b.* Piemonte IKJ ..	737
IKK	*b.* Puglia	737
IKL	*b.* Basilicata	731
IKM	*b.* Campania IKM ..	732
IKN	*b.* Calabria IKN ..	732
IKO	*b.* Lombardia	735
IKP	*b.* Etruria IKP ..	733
IKQ	*b.* Liguria	735
IKR	*b.* Agordat	730
IKS	*b.* Coatit	733
IKT	*b.* Irido	735
IKU	*b.* Goito	735
IKV	*b.* Tripoli	739
IKW	*b.* Atlante	731
IKX	*b.* Minerva IKX ..	736
IKY	*b.* Partenope	737
IKZ	*b.* Montebello	736
ILA	*b.* Bolsena	731
ILB	*b.* Bayonne	731
ILC	*b.* Ancona	730
ILD	*b.* Monte Bianco ..	736
ILE	*b.* Nettuno	736
ILF	*b.* Alberto Cavalletto	730
ILG	*b.* Crema	733
ILI	*b.* Capodimonte ..	732
ILI	*b.* Primula ILI ..	737
ILI	*b.* Cleopatra	732
ILJ	*b.* Bastia	731
ILK	*b.* Carlo Pisacane ..	732
ILL	*b.* Lampo ILL ..	735
ILM	*b.* Pesaro	737
ILN	*b.* Maiello	735
ILO	*b.* Moncenisio ILO ..	736
ILP	*b.* Belluno	731
ILQ	*b.* Wardha	740
ILR	*b.* Cervino	732
ILR	*b.* Tatra ILR	739
ILS	*b.* Splendor	739
ILT	*b* Ansaldo 5	730
ILU	*b.* Ferrara	734
ILV	*b.* Monviso ILV ..	736
ILW	*b.* Monterosa	736
ILX	*b.* Fratelli Bandiera ..	734
ILY	*b.* Ansaldo 4	730
ILZ	*b.* Brescia ILZ ..	731
IMC	*b.* Cariddi	732
IMD	*b.* Amalfi	730
IME	*b.* S. Rossore	738
IMF	*b.* Cogne	733
IMG	*b.* Giove	734
IMI	*b.* Silvio Pellico ..	739
IMJ	*b.* Catania	732

		PAGE
IMK	*b.* Arnaldo da Brescia	731
IML	*b.* Gonzaga	735
IMM	*b.* Montenegro ..	736
IMO	*b.* Marina O IMO ..	735
IMP	*b.* Paraguay	737
IMQ	*b.* Albano	730
IMR	*b.* Trasimeno	739
IMS	*b.* S. Giorgio IMS ..	738
IMT	*b.* Tirreno	739
IMU	*b.* Scrivia	738
IMV	*b.* Favignana	734
IMW	*b.* Nemi	736
IMX	*b.* Tolemaide	739
IMY	*b.* Angelo Brunetti ..	730
IMZ	*b.* Vega	739
INA	*b.* Montello	736
INB	*b.* Nilos	737
IND	*b.* Cesare Battisti ..	732
IND	*b.* Oldemburgo ..	737
INE	*b.* Città di Trieste ..	732
INF	*b.* Orione 2	737
ING	*b.* Capri	732
INH	*b.* Marco Minghetti ..	734
INI	*b.* Regina d'Italia ..	737
INJ	*b.* Pola	737
INK	*b.* Cagliari	731
INL	*b.* Sicilia INL	738
INM	*b.* Milano	736
INN	*b.* Angelo Toso ..	730
INO	*b.* Primula INO ..	737
INP	*b.* Città di Tripoli ..	733
INQ	*b.* Etruria INQ ..	733
INR	*b.* Roma INR ..	738
INS	*b.* Sardegna INS ..	738
INT	*b.* Porto di Alessandretta	737
INU	*b.* Theodo	739
INV	*b.* Porto di Savona ..	737
INW	*b.* Entella	733
INX	*b.* Piemonte INX ..	737
INY	*b.* Po	737
INZ	*b.* Ischia	735
IOA	*b.* Rovigno	738
IOB	*b.* Presidente Wilson ..	737
IOC	*b.* Elba IOC	733
IOD	*b.* Battinin Accame ..	731
IOF	*b.* Antonietta Accame	731
IOG	*b.* Principessa Jolanda	737
IOH	*b.* Affinita	730
IOI	*b.* Amista	730
IOJ	*b.* Chile	732
IOJ	*b.* Guiseppina Hardi ..	734
IOK	*b.* Bolzaneto	731
IOL	*b.* Alacrita	730
IOM	*b.* Albania	730
ION	*b.* Ammiragleo Bettolo	730
ION	*b.* Nitor	737
IOO	*b.* Bormida	731
IOP	*b.* Bulgaria	731
IOQ	*b.* Constantinopli ..	733
IOR	*b.* Carighano	732
IOT	*b.* Pegli	737
IOU	*b.* Brento	731
IOV	*b.* Onoria	737
IOW	*b.* Ada	729
IOX	*b.* Alessandro A ..	730
IOY	*b.* Assiria	731
IOZ	*b.* Iris	735
IPA	*b.* Egadi	733
IPB	*b.* Sumatra	739
IPC	*b.* Iberia	735
IPD	*b.* Graz	734
IPE	*b.* Savoia I	738
IPF	*b.* Fede	734
IPG	*b.* Adda	729
IPH	*b.* Angelica Accame ..	730
IPI	*b.* Lucania I	735
IPJ	*b.* Oceano	737
IPK	*b.* Natale L	736
IPL	*b.* Labor	735
IPN	*b.* Sri Samud	739
IPO	*b.* Caterina Accame ..	732
IPP	*b.* Teresa Accame ..	739
IPQ	*b.* Fagernes	733
IPR	*b.* Sofia Hohemberg ..	739
IPS	*b.* Marsala II	736
IPT	*b.* Ferencz Joseph Kiraly ..	734
IPU	*b.* Ferencz Ferdinand	734
IPV	*b.* Innsbruch	735
IPW	*b.* S. Giusto	738
IPY	*b.* Praga	737
IPZ	*b.* Memfi	736
IQV	*c.* Tivoli Radio ..	605
IQW	*c.* Ancona IQW ..	603
IQX	*c.* Trieste Radio ..	605
IQZ	*c.* Pola	605
IRG	*c.* Massaua IRG ..	589
IRM	*c.* Murano R.G. ..	604
IRT	*c.* Thio	590
ISB	*c.* Merka	603
ISC	*c.* Brava	602
ISD	*c.* Giumbo	602
ISE	*c.* Mogadiscio ISE ..	603
ISF	*c.* Mahaddei Uen ..	603
ISG	*c.* Mogadiscio ISG ..	603
ISH	*c.* Iscia Baidoa ..	603
ISI	*c.* Oddur	603
ISJ	*c.* Bulo Burti	602
ISM	*c.* Itala	603
ISN	*c.* Bardera	602
ISO	*c.* Lugh	603
ITA	*b.* Teresa O	739
ITB	*b.* Bologna	731
ITC	*b.* Confidenza	733
ITD	*b.* Doen Samud ..	733
ITE	*b.* Rosalia	738
ITF	*b.* S. Genmaro ..	738
ITG	*b.* Mongineoro ..	736
ITH	*b.* Monviso ITH ..	736
ITJ	*b.* Caboto	731
ITK	*b.* Dora Baltea ..	733
ITL	*b.* Cerea	732
ITM	*b.* Agios Georgios ..	730
ITN	*b.* Sori	739
ITO	*b.* Armando	731
ITP	*b.* Argentina	731
ITQ	*b.* Francesca	734
ITT	*b.* Laura	735
ITU	*b.* Umbria	739
ITV	*b.* Ninfa	737
ITW	*b.* Castelporziano ..	732
ITX	*b.* Belvedere	731
ITY	*b.* Josto	735
ITZ	*b.* Circe	732
ITZ	*b.* Marzocco	736
IUA	*b.* Garibaldi IUA ..	734
IUB	*b.* Clio	733

		PAGE
IZZ	*b.* Duca degli Abruzzi	733
ICCM	*b.* Elettra	733
JAB	*b.* Yoko Maru ..	761
JAC	*b.* America Maru ..	741
JAD	*b.* Aden Maru ..	740
JAE	*b.* Yaye Maru ..	760
JAF	*b.* Yuri Maru .	761
JAG	*b.* England Maru ..	743
JAH	*b.* Italy Maru ..	747
JAI	*b.* Aki Maru	740
JAJ	*b.* France Maru ..	744
JAK	*b.* Muroran Maru ..	752
JAL	*b.* Alaska Maru ..	740
JAP	*b.* Atlas Maru ..	741
JAQ	*b.* Kaigen Maru ..	747
JAR	*b.* Amur Maru ..	741
JAT	*b.* Atsuta Maru ..	741
JAV	*b.* Koshun Maru ..	750
JAV	*b.* Mitsuki Maru ..	752
JAW	*b.* Awa Maru ..	741
JAX	*b.* Yehime Maru ..	760
JAY	*b.* Anyo Maru ..	741
JAZ	*b.* Amazon Maru ..	741
JBA	*b.* Meichi Maru ..	751
JBB	*b.* Shinbu Maru ..	755
JBC	*b.* Calcutta Maru ..	742
JBD	*b.* Ataka Maru ..	741
JBE	*b.* Capetown Maru ..	742
JBF	*b.* Kaifuku Maru ..	747
JBG	*b.* Bingo Maru ..	742
JBH	*b.* Kureha Maru ..	751
JBI	*b.* Miikesan Maru ..	752
JBJ	*b.* Horaisan Maru ..	746
JBK	*b.* Sakigake Maru No. 3	754
JBL	*b.* Tsurugisan Maru ..	759
JBM	*b.* Azuma Maru ..	741
JBN	*b.* Genmei Maru ..	744
JBO	*b.* Hidson Maru ..	745
JBO	*b.* Hudson Maru ..	746
JBP	*b.* Alps Maru ..	740
JBQ	*b.* Kofuku Maru JBQ	749
JBR	*b.* Siberia Maru ..	756
JBS	*b.* Azumasan Maru ..	741
JBT	*b.* Tosa Maru ..	759
JBU	*b.* Yubari Maru ..	761
JBV	*b.* Ikomasan Maru ..	747
JBX	*b.* Hakushika Maru ..	745
JCA	*b.* Meikai Maru ..	751
JCB	*b.* Akita Maru ..	740
JCC	*b.* Chicago Maru ..	743
JCD	*b.* Canada Maru ..	742
JCE	*b.* Celebes Maru ..	743
JCF	*b.* Hanasaki Maru ..	745
JCG	*b.* Nanking Maru ..	753
JCH	*b.* Tensho Maru ..	758
JCI	*b.* Nagano Maru ..	753
JCK	*b.* Keishin Maru ..	749
JCL	*b.* Borneo Maru JCL	742
JCM	*b.* Lima Maru ..	751
JCN	*b.* Tenkai Maru ..	758
JCO	*b.* Oridono Maru ..	753
JCP	*b.* Yamagata Maru ..	760
JCR	*b.* Indus Maru ..	747
JCS	*c.* Choshi Radio ..	606
JCT	*b.* Yeitai Maru ..	760
JCU	*b.* Sumatra Maru ..	756
JCV	*b.* Shinkoku Maru ..	755
JCW	*b.* Cheribon Maru ..	743
JCW	*b.* Taiyu Maru ..	757

		PAGE
JCY	*b.* Yoshida Maru No. 3	761
JCZ	*b.* Clyde Maru ..	743
JDA	*c.* Dairenwan	606
JDC	*b.* Yuki Maru	761
JDD	*b.* Tofuku Maru ..	758
JDF	*b.* Africa Maru ..	740
JDG	*b.* Meiten Maru ..	752
JDH	*b.* Shinpo Maru ..	755
JDI	*b.* Delagoa Maru ..	743
JDJ	*b.* Denmark Maru ..	743
JDL	*b.* Harve Maru ..	745
JDM	*b.* Seifuku Maru ..	755
JDN	*b.* Annan Maru ..	741
JDO	*b.* Meiko Maru ..	752
JDP	*b.* Suki Maru ..	756
JDQ	*b.* Luzon Maru ..	751
JDR	*b.* Penang Maru ..	753
JDS	*b.* Indo Maru	747
JDU	*b.* Java Maru	747
JDV	*b.* Komagata Maru ..	750
JDW	*b.* Ceylon Maru ..	743
JDX	*b.* Kirin Maru ..	749
JDY	*b.* Rangoon Maru ..	754
JDZ	*b.* Jinsen Maru ..	747
JDZ	*b.* Arizona Maru ..	741
JEB	*b.* Heinan Maru ..	745
JED	*b.* Egypt Maru ..	743
JEE	*b.* Taikai Maru ..	757
JEF	*b.* Shinsei Maru ..	755
JEG	*b.* Arabia Maru ..	741
JEH	*b.* Otaru Maru No. 2	753
JEK	*b* Koei Maru	749
JEM	*b.* Malay Maru ..	751
JEN	*b.* Etna Maru ..	743
JEO	*b.* Kaisho Maru ..	748
JEP	*b.* Ganges Maru ..	744
JEQ	*b.* Yesaki Maru ..	761
JER	*b.* Rashu Maru ..	754
JET	*b.* Hokuto Maru ..	746
JEU	*b.* Daibu Maru ..	743
JEV	*b.* Saigon Maru ..	754
JEW	*b.* Ume Maru	759
JEY	*b.* Nagato Maru ..	753
JEZ	*b.* Saikai Maru ..	754
JFA	*b.* Hayo Maru.. ..	745
JFB	*b.* Inaho Maru ..	747
JFD	*b.* Meidai Maru ..	751
JFE	*b.* Altai Maru ..	740
JFG	*b.* Eifuku Maru ..	743
JFH	*b.* Kishun Maru ..	749
JFI	*b.* Tama Maru ..	757
JFK	*c.* Fukkikaku ..	606
JFL	*b.* Kofuku Maru JFL	749
JFM	*b.* Fushimi Maru ..	744
JFN	*b.* Himalaya Maru ..	745
JFO	*b.* Koan Maru	749
JFP	*b.* Peking Maru ..	753
JFQ	*b.* Hoyeisan Maru ..	746
JFQ	*b.* Hoeisan Maru ..	746
JFS	*b.* Tomiura Maru ..	758
JFT	*b.* Taito Maru ..	757
JFU	*b.* Andes Maru ..	741
JFV	*b.* Meiu Maru	752
JFW	*b.* Taisan Maru ..	757
JFZ	*b.* Tosan Maru ..	759
JGA	*b.* Shikishima ..	755
JGB	*b.* Asahi	741
JGC	*b.* Mikasa	752
JGD	*b.* Hizen	746

		PAGE
JGF	*b.* **Katori**	748
JGG	*b.* **Kashima**	748
JGJ	*b.* **Satsuma JGJ** ..	755
JGK	*b.* **Aki**	740
JGL	*b.* **Nagato**	753
JGM	*b.* **Settsu**	755
JGN	*b.* **Fuso**	744
JGO	*b.* **Yamashiro**	760
JGP	*b.* **Ise**	747
JGQ	*b.* **Ikoma**	747
JGR	*b.* **Kurama**	750
JGT	*b.* **Ibuki**	746
JGU	*b.* **Kongo**	750
JGV	*b.* **Hiei**	745
JGW	*b.* **Kirishima**	749
JGX	*b.* **Haruna**	745
JGY	*b.* Hiuga	746
JHA	*b.* Konan Maru ..	750
JHB	*b.* Harbin Maru ..	745
JHC	*b.* Havana Maru ..	745
JHD	*b.* Genchu Maru ..	744
JHG	*b.* Tencho Maru ..	757
JHH	*b.* Harima Maru ..	745
JHI	*b.* Yepres Maru ..	761
JHJ	*c.* Horomushiro Radio	606
JHK	*b.* Kifuku Maru ..	749
JHL	*b.* Raifuku Maru ..	754
JHM	*b.* Hofuku Maru ..	746
JHN	*b.* Hongkong Maru ..	746
JHO	*b.* Yeboshi Maru ..	760
JHP	*b.* Kibi Maru No. 6 ..	749
JHQ	*b.* Surabaya Maru ..	756
JHR	*b.* Hamburg Maru ..	745
JHR	*b.* Hirano Maru ..	746
JHS	*b.* Kimi Maru ..	749
JHT	*b.* Keifuku Maru ..	749
JHU	*b.* Bombay Maru ..	742
JHV	*b.* Taiho Maru ..	757
JHW	*b.* Hawaii Maru ..	745
JHX	*b.* Hague Maru ..	744
JHY	*b.* Hayatori Maru ..	745
JHZ	*b.* Chifuku Maru ..	743
JIB	*b.* Inaba Maru	747
JIC	*b.* Batavia Maru ..	742
JID	*b.* Gozan Maru ..	744
JIG	*b.* Kotsu Maru ..	750
JIH	*b.* Yoshida Maru No. 1	761
JIJ	*b.* Belgium Maru ..	742
JIK	*b.* Jufuku Maru ..	747
JIL	*b.* Iki Maru	747
JIN	*b.* Genyei Maru ..	744
JIP	*b.* Kaian Maru ..	747
JIQ	*b.* Jinsho Maru ..	747
JIR	*b.* Madras Maru ..	751
JIS	*b.* Victoria Maru ..	760
JIT	*b.* Portland Maru ..	754
JIV	*b.* Heijin Maru ..	745
JIW	*b.* Yone Maru ..	761
JIX	*b.* Yomei Maru ..	761
JIZ	*b.* Vancouver Maru ..	760
JJC	*c.* Funabashi Radio ..	606
JKA	*b.* Kamo Maru ..	748
JKB	*b.* Kobe Maru ..	749
JKC	*b.* Chefoo Maru ..	743
JKD	*b.* Koyo Maru.. ..	750
JKF	*b.* Kumano Maru ..	750
JKG	*b.* Kagi Maru	747
JKH	*b.* Karachi Maru ..	748
JKI	*b.* Sakaki Maru ..	754
JKJ	*b.* Kiso Maru	749
JKK	*b.* Kaikyu Maru ..	747
JKL	*b.* Koma Maru ..	750
JKM	*c.* Komonto	606
JKN	*b.* Kitano Maru ..	749
JKO	*b.* Kasuga Maru ..	748
JKP	*b.* Heimei Maru ..	745
JKQ	*b.* Durban Maru ..	743
JKR	*b.* Katori Maru ..	748
JKS	*b.* Kosai Maru ..	750
JKT	*b.* Kasado Maru ..	748
JKU	*b.* Kunajiri Maru ..	750
JKV	*b.* Fukuyo Maru ..	744
JKW	*b.* Dakar Maru ..	743
JKX	*b.* Kashima Maru ..	748
JKY	*b.* Kiyo Maru ..	749
JLA	*b.* Kuma	750
JLB	*b.* Chitose	743
JLC	*b.* Tsugaru	759
JLF	*b.* Tone	759
JLG	*b.* Chikuma	743
JLJ	*b.* Hirato	746
JLK	*b.* Yahagi	760
JLL	*b.* Suma	756
JLM	*b.* Akashi	740
JLN	*b.* Niitaka	753
JLO	*b.* Tsushima	759
JLP	*b.* Tenryu	758
JLQ	*b.* Tatsuta	757
JMA	*b.* Tsushima Maru JMA	759
JMB	*b.* Hakodate Maru ..	745
JMC	*b.* Boston Maru ..	742
JMP	*c.* Mokpo	607
JMQ	*b.* Mishima Maru ..	752
JMR	*b.* Manila Maru ..	751
JMS	*b.* Urarusan Maru ..	759
JMT	*b.* Malta Maru ..	751
JMU	*b.* Kurushima Maru ..	751
JMV	*b.* Mito Maru	752
JMW	*b.* Matsuyama Maru ..	751
JMX	*b.* Mexico Maru ..	752
JMZ	*c.* Maizuru Radio ..	606
JNA	*b.* Kanagawa Maru ..	748
JNC	*b.* Yonan Maru ..	761
JND	*b.* Neisei Maru ..	753
JNE	*b.* Honolulu Maru ..	746
JNF	*b.* Alabama Maru ..	749
JNG	*b.* Malacca Maru ..	751
JNI	*b.* Miye Maru	752
JNJ	*b.* Argun Maru ..	741
JNK	*b.* Takaska Maru ..	757
JNL	*b.* Nikko Maru ..	753
JNM	*b.* Shanghai Maru ..	755
JNP	*b.* Sydney Maru ..	756
JNR	*b.* Caroline Maru ..	742
JNV	*b.* Macassar Maru ..	751
JNW	*b.* Norway Maru ..	753
JNX	*b.* Manshu Maru ..	751
JNZ	*b.* Nishiyama Maru ..	753
JOA	*b.* Kochi Maru ..	749
JOC	*c.* Otchishi Radio ..	607
JOD	*b.* Kleist Maru JOD ..	749
JOG	*b.* Ogasawara Maru ..	753
JOJ	*b.* Sekko Maru ..	755
JOK	*b.* Morioka Maru ..	752
JOM	*b.* Lyons Maru ..	751
JON	*b.* Okinawa Maru ..	753
JOO	*b.* Reiyo Maru ..	754
JOR	*b.* Holland Maru ..	746

		PAGE
JOS	*c.* Osezaki Radio ..	607
JOT	*b.* Otori Maru ..	753
JOU	*b.* Kashu Maru ..	748
JOV	*b.* Toyen Maru ..	759
JOY	*b.* Choyo Maru ..	743
JOZ	*b.* Rozan Maru ..	754
JPA	*b.* Tsuruga Maru ..	759
JPB	*b.* Borneo Maru JPB..	742
JPC	*b.* Kawachi Maru ..	748
JPF	*b.* Toba Maru ..	758
JPG	*b.* Kaga Maru ..	747
JPH	*b.* Haruna Maru ..	745
JPI	*b.* Meiyo Maru ..	752
JPJ	*b.* Tajima Maru ..	757
JPK	*b.* Hakata Maru ..	744
JPL	*b.* Liverpool Maru ..	751
JPM	*b.* Panama Maru ..	753
JPN	*b.* Portsaid Maru ..	754
JPO	*b.* Iyo Maru	747
JPP	*b.* Persia Maru ..	754
JPQ	*b.* Tottori Maru ..	759
JPR	*b.* Kamakura Maru	748
JPS	*b.* Sanuki Maru ..	755
JPT	*b.* Toyohashi Maru ..	759
JPU	*b.* Tatsuno Maru ..	757
JPV	*b.* Chosen Maru ..	743
JPW	*b.* Wakasa Maru ..	760
JPX	*b.* Buyo Maru ..	742
JPY	*b.* Shinyo Maru JPY	755
JPZ	*b.* Tenpaisan Maru ..	758
JRA	*b.* Asama	741
JRB	*b.* Tokiwa	758
JRC	*b.* Yakumo	760
JRD	*b.* Adzuma	740
JRF	*b.* Iwate	747
JRG	*b.* Idzumo	746
JRJ	*b.* Kasuga	748
JRK	*b.* Nisshin	753
JRL	*b.* Aso	741
JSA	*c.* Rasajima	607
JSB	*c.* Shogetsubito ..	607
JSD	*b.* Sado Maru	754
JSE	*b.* Spain Maru ..	756
JSF	*b.* Sweden Maru ..	756
JSH	*b.* Shinyo Maru JSH	755
JSJ	*b.* Scotland Maru ..	755
JSK	*b.* Shiragi Maru ..	755
JSL	*b.* Genoa Maru ..	744
JSM	*c.* Shiomisaki Radio ..	607
JSN	*b.* Shinano Maru ..	755
JSO	*b.* Samarang Maru ..	755
JSP	*b.* Singapore Maru ..	756
JSQ	*b.* Shunko Maru ..	755
JSS	*c.* Shoseito	607
JST	*b.* Seattle Maru ..	755
JSU	*b.* Suwa Maru ..	756
JSX	*c.* Shimotsui Radio ..	607
JSY	*b.* Seiyo Maru ..	755
JSZ	*b.* Shidzuoka Maru ..	755
JTA	*b.* Tacoma Maru ..	756
JTB	*b.* Tamba Maru ..	757
JTC	*b.* Taichu Maru ..	757
JTD	*b.* Texas Maru ..	758
JTE	*b.* Thames Maru ..	758
JTF	*b.* Tone Maru ..	759
JTG	*b.* Tango Maru ..	757
JTI	*b.* Tyne Maru ..	759
JTK	*b.* Taikwa Maru ..	757
JTL	*b.* Tsushima Maru JTL	759
JTM	*b.* Taisei Maru ..	757
JTN	*b.* Tainan Maru ..	757
JTP	*b.* Tamatsu Maru ..	757
JTQ	*b.* Tokushima Maru ..	758
JTS	*c.* Tsunoshima Radio	607
JTT	*b.* Atlantic Maru ..	741
JTU	*b.* Taketoyo Maru ..	757
JTU	*b.* Tokuyama Maru ..	758
JTV	*b.* Tsurushima Maru ..	759
JTX	*b.* Toyama Maru ..	759
JTY	*b.* Tenyo Maru ..	758
JUC	*b.* Fuji	744
JUD	*b.* Iwami	747
JUG	*b.* Suwo	756
JUK	*b.* Okinoshima ..	753
JUL	*b.* Mishima	752
JUN	*b.* Itsukushima ..	747
JUO	*b.* Hashidate	745
JUP	*b.* Chiyoda	743
JUQ	*b.* Akitsushima ..	740
JUR	*b.* Wakamiya	760
JUT	*b.* Manshu	751
JUU	*b.* Komahashi ..	750
JUV	*b.* Karasaki	748
JUX	*b.* Yamato	760
JUY	*b.* Musashi	753
JWB	*b.* Chihaya	743
JWC	*b.* Yodo	761
JWD	*b.* Mogami	752
JWF	*b.* Uji	759
JWG	*b.* Sumida	756
JWI	*b.* Fushimi	744
JWK	*b.* Toba JWK.. ..	758
JWL	*b.* Saga JWL	754
JYA	*b.* Atagosan Maru ..	741
JYC	*b.* Oura Maru	753
JYD	*b.* Yawata Maru ..	760
JYE	*b.* Yubae Maru ..	761
JYF	*b.* Nankai Maru ..	753
JYG	*b.* Amagisan Maru ..	740
JYH	*b.* Yokohama Maru ..	761
JYI	*b.* Yayoi Maru ..	760
JYJ	*b.* Mandasan Maru ..	751
JYK	*b.* Kinkasan Maru ..	749
JYL	*b.* Korea Maru ..	750
JYM	*b.* Tsuyama Maru ..	759
JYN	*b.* Somidono Maru ..	756
JYO	*b.* Toyooka Maru ..	759
JYP	*b.* Hokkai Maru ..	746
JYQ	*b.* Kongosan Maru ..	750
JYR	*b.* Riojun Maru ..	754
JYS	*b.* Yakumo Maru ..	760
JYT	*b.* Fukui Maru ..	744
JYU	*c.* Minamioagarijima..	607
JYV	*b.* Ayaha	741
JYW	*b.* Tokiwa Maru ..	758
JYX	*b.* Siam Maru.. ..	756
JYY	*b.* Burma Maru ..	742
JYZ	*b.* Hozan Maru ..	746
KN	*c.* Constance	597
KO	*c.* Konigsberg ..	597
KAF	*c.* Amrumbank Light-ship	597
KAH	*c.* Helgoland	598
KAJ	*c.* Eider Lightship ..	597
KAL	*c.* List F.S.	598
KAN	*c.* Wilhemshaven III Einfahrt F.S. ..	599
KAO	*c.* List F.R.A ..	598

		PAGE
KAP	*c.* Pillau F.S.	589
KAR	*c.* Neumünster F.S. ..	598
KAV	*c.* Norddeich	599
KAW	*c.* Swinemünde ..	599
KAY	*c.* Stolpmunde F.S. und F.R.A. ..	599
KAZ	*c.* Danzig	586
KBC	*c.* Fehmarnbelt Lightship	598
KBE	*c.* Warnemunde F.S.	599
KBF	*c.* Elbe Lightship Eins	598
KBH	*c.* Bremerhaven Lloydhalle	597
KBK	*c.* Bülk F.S.	597
KBL	*c.* Eiderlotsengaliot Lightship ..	597
KBM	*c.* Borkum F.S. ..	597
KBN	*c.* Nordholz F.S. ..	599
KBO	*c.* Borkum F.R.A. ..	597
KBQ	*c.* Nordholz F.R.A. ..	599
KBR	*c.* Borkum Riff Lightship	587
KBV	*c.* Sassintz	599
KBW	*c.* Weser Lightship ..	599
KBX	*c.* Cuxhaven	597
KBY	*c.* Warnemunde F.R.A.	599
KDA	*b.* Philadelphia KDA	974
KDB	*b.* Caracas	910
KDC	*c.* Douglas, Arizona ..	639
KDD	*b.* Cartago	911
KDE	*b.* Carillo	910
KDF	*b.* Coppename	918
KDG	*b.* Parismina	972
KDH	*b.* Heredia	939
KDI	*b.* Abangarez ..	895
KDJ	*b.* S. Jose KDJ ..	1001
KDK	*b.* Atenas	901
KDL	*b.* Fort Worth ..	931
KDL	*b.* Leviss	955
KDM	*b.* Maracaibo	959
KDO	*b.* Esparta	929
KDP	*c.* Portland, Oregon KDP	650
KDQ	*b.* Santore	984
KDR	*b.* Limon	956
KDS	*b.* Sixaola	987
KDT	*b.* Turrialba	1005
KDV	*b.* Libby Maine ..	956
KDW	*c.* Nakat Inlet, Alaska	561
KDY	*b.* Walter D. Noyes ..	1008
KDZ	*b.* Zulia	1017
KEA	*b.* Phyllis	974
KEB	*b.* Sabine KEB ..	983
KEC	*b.* Concho	917
KEE	*b.* West Catanace ..	1010
KEF	*b.* Henry R. Mallory ..	939
KEG	*b.* Rio Grande ..	979
KEH	*b.* Nueces	968
KEI	*b.* Medina	961
KEJ	*b.* Alamo	898
KEK	*b.* S. Marcos	1002
KEL	*b.* Isonomia	942
KEM	*b.* Comal	917
KEN	*b.* H. F. Dimock ..	939
KEP	*b.* Lampasas	955
KEQ	*c.* Port Walter ..	562
KER	*c.* Kereinik	628
KER	*b.* H.M. Flagler ..	939
KES	*b.* S. Jacinto	1001
KET	*c.* Bolinas KET ..	637
KEU	*b.* S. V. Harkness ..	1001
KEX	*b.* Josiah Macy ..	944
KEY	*c.* Cape Edwards ..	559
KEZ	*b.* S. Lorenzo KEZ ..	1002
KFA	*b.* City of Columbus ..	914
KFB	*b.* City of Atlanta ..	914
KFD	*b.* Lake Janet ..	953
KFE	*b.* Wynooche	1016
KFF	*b.* Frieda	932
KFG	*b.* Feltore	930
KFH	*b.* West Ashawa ..	1009
KFI	*b.* I. D. Fletcher ..	941
KFJ	*b.* City of Augusta ..	914
KFK	*b.* City of Savannah ..	915
KFM	*b.* Mahnet	951
KFN	*b.* Tormentor	1005
KFO	*b.* Buccaneer	908
KFP	*b.* Nacooches	965
KFQ	*b.* Owego	971
KFS	*b.* Benjamin Brewster	905
KFT	*b.* Bonita	906
KFU	*c.* Leuto	644
KFY	*b.* City of Montgomery	910
KFZ	*b.* City of St. Louis ..	915
KGA	*b.* Coamo	916
KGB	*b.* Baganito	902
KGD	*b.* Suruga	1000
KGE	*b.* Westwego	1013
KGH	*c.* Hollister, California	643
KGI	*c.* Oakland, California	649
KGJ	*b.* S. Juan KGJ ..	1001
KGK	*b.* Edgar F. Luckenbach	927
KGL	*b.* Dochra	923
KGM	*b.* Mexicano KGM ..	961
KGN	*c.* Portland, Oregon KGN	650
KGO	*c.* Underwood, Washington	652
KGP	*b.* Ponce	975
KGQ	*b.* Edward Luckenbach	927
KGR	*b.* Cambridge KGR ..	909
KGS	*b.* Senator Bailey ..	985
KGT	*b.* J. L. Luckenbach ..	943
KGV	*b.* Frederick Luckenbach	932
KGX	*b.* Sewalls Point ..	985
KGZ	*b.* Julia Luckenbach ..	944
KHA	*c.* Uyak Alaska ..	563
KHB	*c.* Kvichak, Alaska ..	561
KHC	*c.* Chignik	559
KHD	*b.* Stanwood	989
KHE	*b.* Lake Silver ..	954
KHF	*c.* Snag Point.. ..	562
KHG	*c.* Clarks Point ..	559
KHI	*c.* Isabel de Basilan ..	619
KHK	*c.* Wahiawa	601
KHL	*c.* Lahaina	601
KHM	*c.* Lihue	601
KHN	*c.* Kawaihae	601
KHO	*c.* Kaunakakai ..	601
KHP	*b.* Mangore	958
KHQ	*c.* Phoenix, Arizona ..	649
KHR	*b.* J. W. Van Dyke ..	945
KHS	*b.* H. C. Folger ..	938
KHT	*c.* Naknek KHT ..	561
KHU	*b.* Lake Ogden ..	953
KHV	*b.* Lake Jessup ..	953

		PAGE
KHW	*b.* Lake Charles	948
KHY	*b.* K. I. Luckenbach	946
KHZ	*b.* Mystic	965
KIA	*b.* Ardmore	901
KIB	*b.* Muskoges	965
KIC	*b.* Standard KIC	989
KID	*b.* Matinicock	959
KIE	*c.* Kahuku	601
KIG	*b.* Pioneer KIG	974
KIH	*b* Corning	918
KIJ	*b.* Acme	896
KIK	*b.* Westerner	1011
KIM	*c.* Latouche, Alaska	561
KIN	*b.* Patrol KIN	973
KIO	*b.* Brynhilda	908
KIP	*b.* General W. C. Gorgas	934
KIQ	*b.* Astral	901
KIR	*b.* Eagle KIR	924
KIS	*c.* Marshall, Alaska	561
KIT	*b.* Tiger	1004
KIU	*b.* Western Hero	1011
KIW	*c.* Victor, Colorado	652
KIX	*c.* Denver, Colorado	639
KJA	*c.* Jualin	560
KJC	*b.* Ocones	969
KJD	*b.* North Land KJD	968
KJE	*b.* Norlina	968
KJF	*b.* Carolinian	911
KJG	*b.* Eurana	929
KJH	*b.* West Wind	1013
KJI	*b.* Satsuma KJI	984
KJK	*c.* King Cove	560
KJL	*c.* False Pass	559
KJM	*b.* West Cherow	1010
KJN	*b.* J. A. Bostwick	943
KJO	*b.* Munisla	965
KJP	*b.* Joseph R. Parrott	944
KJQ	*c.* Craftonville	639
KJT	*b.* Waban	1007
KJU	*b.* Bacoi	902
KJV	*b.* West Haven	1011
KJW	*b.* O. T. Waring	971
KJX	*b.* Westland	1012
KJY	*b.* West Point	1013
KJZ	*b.* Chincha	913
KKA	*c.* Yakutat, Alaska	563
KKB	*b.* Sol (El)	987
KKC	*b.* Chalmette	912
KKD	*b.* Comus	917
KKE	*b.* Topila	1005
KKF	*b.* Jefferson County	943
KKF	*b.* Torres	1005
KKG	*b.* Almirante (El)	899
KKH	*b.* Captain KKH (El)	910
KKI	*b.* Kilkenny KKI	946
KKJ	*b.* West Celeron	1010
KKL	*b.* Alba (El)	898
KKM	*b.* Momus	963
KKN	*b.* Norte (El)	968
KKO	*b.* Excelsior	929
KKP	*b.* Mahanna	957
KKQ	*b.* Sud (El)	999
KKR	*b.* Creole	919
KKS	*b.* Siglo (El)	986
KKT	*b.* Cid (El)	914
KKU	*b.* Mundo (El)	965
KKV	*b.* Oriente (El)	970
KKW	*b.* Valle (El)	1007
KKX	*b.* Occidente (El)	969

		PAGE
KKY	*b.* Dia (El)	923
KKZ	*b.* Rio (El)	979
KLA	*b.* Pastores	973
KLC	*b.* Calamares	909
KLE	*b.* Zacapa	1017
KLF	*b.* Metapan	961
KLG	*b.* S. Marta	1002
KLH	*b.* Saramaca	984
KLI	*b.* Suriname	1000
KLJ	*b.* Beatrice	904
KLK	*b.* Craster Hall	919
KLL	*c.* Thompson Falls	652
KLM	*b.* Bantu	903
KLN	*b.* Abbeville	896
KLO	*b.* S. Rosalia	1002
KLP	*c.* Lewistown, Montana	644
KLQ	*c.* Rainbow, Montana	650
KLR	*b.* Crofton Hall	920
KLS	*c.* Los Angelos, California	647
KLT	*b.* Howick Hall	940
KLU	*b.* Charlton Hall	913
KLV	*b.* S. Mateo	1002
KLW	*c.* Port Althorp	562
KLX	*b.* Kermanshah	946
KLY	*b.* Deepwater	921
KMA	*b.* Allianca	899
KMB	*b.* Amolco	899
KMD	*b.* Cristobal	920
KME	*b.* Pennant	973
KMF	*c.* Egegik	559
KMG	*c.* Ekuk, Alaska	559
KMH	*b.* Panama KMH	972
KMI	*b.* Tivives	1004
KMK	*c.* Naknek KMK	561
KML	*c.* Lockanok, Alaska	561
KMM	*b.* Panuco KMM	972
KMN	*c.* Butte Montana	637
KMP	*c.* Bristol Bay, Alaska	559
KMQ	*b.* Sherman KMQ	986
KMR	*c.* Khartoum	628
KMR	*b.* Wellington KMR	1009
KMS	*b.* Ancon	899
KMT	*c.* Libbyville, Alaska	561
KMU	*c.* Ugashik	563
KMV	*b.* Advance	897
KMW	*c.* Akutan	559
KMX	*b.* Colon KMX	916
KMY	*b.* Holden Evans	940
KMZ	*b.* General G. W. Goethals	933
KNA	*b.* Dorothy Bradford	923
KNB	*b.* Lexington KNB	955
KNC	*b.* Concord KNC	917
KND	*b.* Plymouth KND	975
KNE	*b.* Clare	915
KNF	*b.* Wm. G. Warden	1015
KNG	*b.* Bradford	907
KNH	*b.* Brockton	907
KNI	*b.* De Soto	922
KNK	*b.* Marica	959
KNL	*b.* Nelson	966
KNM	*b.* Millinocket	962
KNN	*b.* Wico	1014
KNO	*b.* Trinidadian	1005
KNP	*b.* Dayton	921
KNQ	*b.* F. Q. Barstow	931
KNS	*b.* Sucrosa	999
KNU	*b.* Currier	920

		PAGE
KUG	*b.* Munplace	965
KUH	*b.* Munwood	965
KUI	*b.* Munamar	964
KUJ	*b.* Mundale	964
KUK	*b.* Munsomo	965
KUL	*b.* Louisiana KUL ..	957
KUM	*b.* Texas KUM ..	1003
KUN	*b.* Neptune KUN ..	966
KUP	*b.* Pennsylvania KUP	973
KUQ	*b.* Maine KUQ ..	957
KUR	*b.* Georgia KUR ..	934
KUS	*b.* Florida KUS ..	931
KUT	*b.* Pan-American ..	972
KUU	*b.* Brabant	907
KUV	*b.* Virginia KUV ..	1007
KUW	*b.* New York KUW ..	967
KUX	*b.* Munalbro	964
KUZ	*b.* Coastwise	916
KVA	*b.* Apache KVA ..	900
KVB	*b.* Arapahoe	900
KVC	*b.* Comanche KVC ..	917
KVD	*b.* Munrio	965
KVE	*b.* Munindies	965
KVF	*b.* Iroquois KVF ..	942
KVG	*b.* Chestnut Hill ..	913
KVH	*b.* Huron KVH ..	941
KVI	*c.* Unga Island, Alaska	563
KVJ	*b.* Walter D. Munson	1008
KVK	*b.* Cherokee	913
KVL	*b.* Lenape	955
KVM	*b.* Mohawk KVM ..	962
KVN	*b.* Tanamo	1003
KVO	*b.* Sagua KVO ..	983
KVP	*b.* Charles Braley ..	912
KVR	*b.* Elinor	928
KVS	*b.* Gulf Queen ..	936
KVV	*c.* Koggiung KVV ..	560
KVX	*b.* Allaguash	898
KVY	*b.* William Isom ..	1014
KVZ	*b.* Relay	979
KWA	*b.* Mt. Vernon Bridge	964
KWB	*b.* Fort Pitt Bridge ..	931
KWC	*b.* Morro Castle ..	964
KWD	*b.* Antilla	900
KWE	*b.* Santiago	984
KWF	*b.* Cauto	911
KWG	*b.* Seguranca	985
KWH	*c.* Port Chatham ..	562
KWI	*b.* Camaguey	909
KWJ	*b.* Yucca KWJ ..	1017
KWK	*b.* W. B. Keene ..	1009
KWL	*b.* Yadkin	1016
KWM	*b.* Panuco KWM ..	972
KWN	*b.* Guantanamo ..	936
KWN	*b.* Katrina Luckenbach	945
KWO	*c.* Port Beauclaire ..	562
KWP	*b.* Sunoil	1000
KWQ	*c.* Saltchuck, Alaska..	562
KWR	*c.* Port Moller ..	562
KWS	*c.* Lost Harbour ..	561
KWV	*b.* Sacramento KWV..	983
KWW	*c.* Chicagof	559
KWW	*c.* Radioville, Alaska..	562
KWX	*b.* Mexico KWX ..	961
KWY	*b.* Monterey KWY ..	963
KWZ	*b.* Esperanza	929
KXA	*b.* Boston KXA ..	906
KXB	*b.* City of Lowell ..	915

		PAGE
KXC	*b.* Commonwealth KXC	917
KXD	*b.* Firmore	930
KXE	*b.* Mohawk KXE ..	962
KXF	*b.* New Hampshire KXF	967
KXG	*b.* Archer	900
KXH	*b.* Plymouth KXH ..	975
KXI	*b.* Priscilla	976
KXJ	*b.* Providence	976
KXK	*c.* Funter, Alaska ..	560
KXL	*b.* City of Taunton ..	915
KXM	*b.* Mohegan	963
KXN	*b.* New Haven KXN..	967
KXO	*b.* City of Brockton ..	914
KXP	*b.* Pequonnock ..	974
KXQ	*b.* Chester W. Chapin	913
KXR	*b.* Richard Peck ..	979
KXS	*b.* Boston KXS ..	906
KXT	*b.* Fairmont	929
KXU	*b.* Westfield	1011
KXV	*c.* Nelson Lagoon, Alaska	561
KXW	*c.* Ikatan, Alaska ..	560
KXX	*b.* Stephen R. Jones ..	990
KXY	*b.* Lewis K. Thurlow..	955
KXZ	*b.* Felix Taussig ..	930
KYA	*b.* Kanawha KYA ..	945
KYB	*b.* North Wind ..	968
KYC	*b.* Corsair	918
KYD	*b.* Mount Baker ..	964
KYE	*b.* Casiana	911
KYF	*b.* McClellan	960
KYG	*b.* Wild Duck	1014
KYH	*b.* Aloha	899
KYK	*c.* Karluk, Alaska ..	560
KYL	*c.* Alitak, Alaska ..	559
KYM	*b.* Armenia	901
KYO	*b.* Noma	967
KYP	*b.* Oneida	970
KYR	*b.* Undaunted KYR	1006
KYS	*b.* Yosemite KYS ..	1017
KYT	*b.* Redondo KYT ..	979
KYV	*b.* Ascutney	901
KYX	*b.* Wana	1008
KYZ	*b.* Thorobred	1004
KZA	*b.* Alberta KZA ..	898
KZB	*b.* Alicia KZB ..	898
KZD	*b.* Cornelia	918
KZE	*b.* Zenith	1017
KZF	*b.* Edith	927
KZG	*b.* Carolyn	911
KZH	*b.* Helen	938
KZJ	*b.* Jean..	943
KZK	*b.* Hilton	939
KZL	*b.* Halcyon	937
KZO	*b.* Margaret KZO ..	959
KZP	*b.* Evelyn KZP ..	929
KZQ	*b.* Ruth	981
KZR	*b.* Remlik III... ..	979
KZS	*b.* Santanta	984
KZS	*b.* Satanta	728
KZT	*b.* Everett	929
KZU	*b.* United States KZU	1006
KZV	*b.* Malden	958
KZW	*b.* Melrose	961
KZX	*b.* Newton KZX ..	967
KZY	*c.* Anchorage ..	559
KBAA	*b.* Lake Ontario ..	953
KBAI	*b.* Lake Bridge ..	948

		PAGE
KDHG	*b.* Pagassct	971
KDHH	*b.* Charles H. Cramp..	912
KDHI	*b.* Intrepid	942
KDHJ	*b.* Bibbco	905
KDHK	*b.* Yapalaga	1016
KDHL	*b.* Argosy	901
KDHM	*c.* North Platte, Nebraska ..	649
KDHN	*c.* Rock Springs, Wyoming ..	650
KDHO	*b.* Japan Arrow ..	943
KDHP	*b.* India Arrow ..	941
KDHQ	*b.* Java Arrow ..	943
KDHS	*b.* Wm. Boyce Thompson ..	1015
KDHT	*b.* S. Veronica ..	1002
KDHU	*b.* Lilmae	956
KDHV	*b.* Brush	908
KDHW	*b.* S. Mielih	1002
KDHX	*b.* A. A. Daugherty ..	895
KDHY	*b.* Eastern Leader ..	927
KDHZ	*b.* Dawn	921
KDIB	*c.* Rawlins, Wyoming	650
KDIC	*c.* Ferris Oil Field, Wyoming ..	640
KDID	*b.* Medon	961
KDIF	*b.* Hanley	937
KDIG	*b.* Narbo	966
KDIH	*b.* Narcissus	966
KDIJ	*b.* Cuprum	920
KDIK	*b.* West Cusseta ..	1010
KDIL	*b.* Griffdu	936
KDIM	*b.* George E. Weed ..	934
KDIN	*b.* Colin H. Livingstone	916
KDIP	*b.* Vaba	1006
KDIQ	*b.* Cedarhurst	911
KDJK	*b.* Yalza	1016
KDJL	*b.* Steel Inventor ..	990
KDJM	*b.* Storm King KDJM	990
KDJN	*b.* Cambrai KDJN ..	909
KDJO	*b.* Oneida KDJO ..	970
KDJP	*b.* Kiowa KDJP ..	947
KDJQ	*b.* Cayuga KDJQ ..	911
KDJR	*b.* Onondaga KDJR ..	970
KDJS	*b.* Chippewa KDJS ..	913
KDJT	*c.* Daly, Alaska ..	559
KDJU	*c.* Warren, Alaska ..	563
KDJV	*b.* Joseph Seep ..	944
KDJW	*b.* Seneca KDJW ..	985
KDJX	*b.* Romagne	980
KDJY	*b.* Natchez	966
KDJZ	*b.* Montgomery City ..	963
KDKA	*c.* East Pittsburgh, Pennsylvania ..	640
KDKB	*b.* Eastern Sword ..	927
KDKC	*b.* Hopatcong	940
KDKD	*b.* Emergency Aid ..	928
KDKE	*b.* Chateau Thierry ..	913
KDKF	*c.* New York KDKF..	648
KDKG	*b.* William H. Doheny	1014
KDKH	*b.* Algonquin KDKH..	898
KDKL	*b.* Camden KDKL ..	909
KDKM	*b.* Natirar	966
KDKN	*b.* Dinsmore	923
KDKO	*b.* Maracay	959
KDKP	*b.* Lake Gatun ..	952
KDKQ	*b.* Rodman Swift ..	980
KDKR	*b.* Warbler KDKR ..	1008
KDKS	*b.* Willett	1014
KDKT	*b.* Estero (El) ..	928
KDKU	*b.* Dan F. Hanlon ..	921
KDKX	*b.* W. J. Hanna ..	1015
KDKY	*b.* Peacock KDKY ..	973
KDKZ	*b.* Somme KDKZ ..	987
KDLA	*b.* Charlie Watson ..	912
KDLB	*b.* Creole State ..	919
KDLC	*b.* Pearldon	973
KDLD	*b.* Suwarinco	1000
KDLE	*b.* Suwordenco ..	1001
KDLF	*b.* Sujameco	999
KDLG	*b.* Reaper	978
KDLH	*b.* Franklin K. Lane..	932
KDLI	*b.* Chaumont	913
KDLJ	*b.* Artemis KDLJ ..	901
KDLK	*b.* Cuba KDLK ..	920
KDLL	*b.* A. L. Kent ..	898
KDLM	*b.* Wacosta	1007
KDLN	*b.* Henry S. Grove ..	939
KDLO	*b.* Tuscaloosa City ..	1006
KDLP	*c.* Malita	619
KDLQ	*c.* Culion	618
KDLR	*c.* S. Francisco, Philippine Islands ..	619
KDLS	*b.* Sugillenco	999
KDLT	*b.* George Pierce ..	934
KDLU	*b.* Blue Point	906
KDLV	*b.* Marne KDLV ..	959
KDLW	*b.* Herman Frasch ..	939
KDLX	*b.* Mary Luckenbach..	959
KDLY	*c.* Sugarland	651
KDLZ	*c.* Galveston KDLZ ..	643
KDMA	*b.* Eugene V. R. Thayer	929
KDMB	*b.* Agwisea	897
KDMB	*b.* W. S. Miller ..	1016
KDMC	*b.* Agwimars	897
KDMD	*b.* Agwiworld	897
KDME	*b.* Moffitt	962
KDMF	*b.* Ourcq	971
KDMG	*b.* Estrada Palma ..	929
KDMH	*b.* Memnon KDMH ..	961
KDMI	*b.* Namasket	965
KDMJ	*b.* Peralta	974
KDMK	*c.* Fort Worth ..	643
KDML	*b.* S. C. T. Dodd ..	985
KDMM	*b.* Nacata	965
KDMN	*b.* John Worthington..	940
KDMO	*b.* Muriel	965
KDMP	*b.* W. H. Libby ..	1013
KDMQ	*b.* Wolverine State ..	1015
KDMS	*b.* Samuel L. Fuller ..	983
KDMT	*b.* Joseph M. Cudahy..	944
KDMU	*b.* Wichita	1014
KDMV	*b.* City of Elwood ..	914
KDMX	*c.* Port Lebak ..	619
KDMY	*b.* P. J. Reilly ..	975
KDMZ	*b.* District of Columbia	923
KDNA	*b.* Isleo (El)	928
KDNB	*b.* Tours KDNB ..	1005
KDNC	*b.* Aisne KDNC ..	897
KDND	*b.* Quinault	976
KDNE	*b.* Naamhok	965
KDNF	*b.* Dewey KDNF ..	923
KDNG	*b.* Swiftsure	1001
KDNH	*b.* Sujerseyco	999
KDNI	*b.* Sunewarkco ..	1000
KDNJ	*b.* Kingfisher KDNJ..	946
KDNK	*b.* M. F. Elliott ..	961
KDNL	*b.* Durham KDNL ..	923

		PAGE
KDNM	*b.* Wisdom II ..	1015
KDNN	*b.* Agwilake	897
KDNO	*b.* Gulfking	936
KDNP	*b.* City of Dalhart ..	914
KDNQ	*b.* City of Brunswick..	914
KDNR	*b.* Lake Mirafeores ..	953
KDNS	*b.* Yorba Linda ..	1017
KDNT	*c.* Bakersfield ..	636
KDNU	*c.* Fresno, California ..	643
KDNV	*b.* Hawkeye State ..	938
KDNW	*b.* Lago (El)	928
KDNX	*b.* Sunugentco ..	1000
KDNY	*b.* Favorite KDNY ..	930
KDNZ	*b.* Gorgona KDNZ ..	935
KDOB	*b.* Ala	897
KDOC	*b.* Cebu	911
KDOD	*b.* Livingstone Roe ..	956
KDOF	*b.* Bessemer City ..	905
KDOH	*b.* Crampton Anderson	919
KDOI	*b.* Consort	917
KDOJ	*b.* Sea Lion	985
KDOK	*b.* Albert E. Watts ..	898
KDOL	*b.* F. C. Latrobe ..	930
KDOM	*b.* Annapolis KDOM ..	899
KDON	*b.* Volant	1007
KDOP	*b.* Astrea KDOP ..	901
KDOQ	*b.* Richmond KDOQ	979
KDOR	*b.* Thomas H. Wheeler	1004
KDOS	*b.* Swift Arrow ..	1001
KDOT	*b.* Wenatchee	1009
KDOV	*b.* Stonewall	990
KDOW	*b.* America KDOW ..	899
KDOX	*b.* Pocahontas.. ..	975
KDOZ	*b.* Granite State ..	935
KDPA	*b.* Silver State ..	986
KDPB	*c.* Minneapolis, Minnesota	647
KDPC	*b.* Suspearco	1000
KDPD	*b.* Mauna Kea ..	960
KDPE	*b.* Gargoyle	933
KDPF	*b.* Swiftstar	1001
KDPG	*b.* Liebre	956
KDPL	*b.* Walter Jennings ..	1008
KDPN	*b.* Arden	901
KDPO	*b.* Agwistar	897
KDPP	*b.* Kennecott	945
KDPQ	*b.* Tuxpanoil	1006
KDPR	*b.* Montebello ..	963
KDPS	*c.* Baytown, Texas ..	637
KDPT	*c.* S. Diego, California KDPT	651
KDPU	*c.* Cascada, California	638
KDPV	*c.* Camp 60, California	637
KDPW	*c.* Camp 61, California	637
KDPX	*b.* Placentia (La) ..	955
KDPY	*b.* Fairfield City ..	929
KDPZ	*b.* Gold Star KDPZ ..	935
KDQA	*c.* Chicago KDQA ..	639
KDQB	*b.* Ward	1008
KDQC	*c.* Cincinnati, Ohio ..	639
KDQD	*b.* E. R. Kemp ..	929
KDQE	*b.* Galveston KDQE ..	933
KDQF	*b.* Jeff Davis	943
KDQG	*b.* Oldham	969
KDQH	*b.* Meanticut	961
KDQI	*b.* West O'Rowa ..	1013
KDQJ	*b.* Solana	987
KDQK	*b.* Franklin KDQK ..	931
KDQL	*b.* Sucubaco	999
KDQM	*b.* Aladdin KDQM ..	897
KDQN	*b.* Fall River Valley ..	640
KDQN	*c.* Fall River Valley, California ..	640
KDQO	*c.* S. Francisco KDQO	651
KDQQ	*b.* Cigarette	914
KDQR	*b.* Robert C. Sudden..	980
KDQS	*b.* Cerro-Ebano ..	912
KDQT	*b.* Mount Carroll ..	964
KDQU	*b.* Sea Monarch ..	985
KDQV	*b.* Swift Scout ..	1001
KDQW	*b.* Cairo KDQW ..	909
KDQX	*b.* S. Louis KDQX ..	1002
KDQY	*b.* Cerro-Azul	912
KDQZ	*b.* Frank G. Drum ..	931
KDRA	*b.* Fearless	930
KDRB	*b.* Gulf Prince.. ..	936
KDRC	*b.* Agwismith	897
KDRD	*b.* R. J. Hanna ..	979
KDRE	*b.* K. R. Kingsbury ..	947
KDRF	*c.* Amuguis	618
KDRG	*b.* Vancolite KDRG ..	1007
KDRH	*c.* Ruby, Alaska ..	562
KDRI	*b.* Acropolis	896
KDRJ	*b.* Selma City.. ..	985
KDRK	*b.* Swift Eagle ..	1001
KDRL	*b.* Centennial State ..	911
KDRM	*b.* Henry D. Whiton..	939
KDRN	*b.* E. W. Sinclair ..	929
KDRO	*c.* S. Francisco KDRO	651
KDRP	*b.* Suphenco	1000
KDRQ	*b.* Manulani	959
KDRR	*b.* Delphine KDRR ..	922
KDRS	*b.* Mindoro	962
KDRT	*b.* Cuba KDRT ..	920
KDRU	*b.* Luzon	957
KDRV	*b.* Mount Clinton ..	964
KDRW	*b.* Buckeye State ..	908
KDRX	*b.* Agwihavre	897
KDRY	*c.* Nixon Fork, Alaska	561
KEBD	*b.* Abron	896
KEBF	*b.* Edgefield	927
KEBG	*b.* Fort Stevens ..	931
KEBJ	*b.* Fort Scott ..	931
KEBK	*b.* Fort Smith ..	931
KEBL	*b.* Fort Sill	931
KEBM	*b.* Lake Giltedge ..	952
KEBN	*b.* Lake Girth.. ..	952
KEBP	*b.* Lake Farabee ..	949
KEBQ	*b.* West Henshaw ..	1011
KEBR	*b.* Lake Strabo ..	954
KEBS	*b.* Jekyl	943
KEBT	*b.* Nesco	966
KEBV	*b.* Lake Flushing ..	951
KEBX	*b.* Remus	979
KEBZ	*b.* Lambs (The) ..	955
KECB	*b.* Edenton	927
KECC	*b.* Marshfield	959
KECF	*b.* Cawker	911
KECG	*b.* Chicago Bridge ..	913
KECJ	*b.* Decatur Bridge ..	921
KECK	*b.* Hico..	938
KECL	*b.* Opelika	970
KECM	*b.* Lake Gitano ..	952
KECN	*b.* Lake Fannin ..	949
KECR	*b.* West Tacook ..	1013
KECS	*b.* Duquesne	923
KECT	*b.* Horado	940
KECV	*b.* Lake Flynus ..	951

		PAGE
KECX	b. West Imboden	1011
KECZ	b. Ahala	897
KEDB	b. Balosaro	903
KEDC	b. Dalagada	921
KEDD	b. Acrema	896
KEDF	b. Yawah	1017
KEDG	b. Kamesit	945
KEDK	b. Onekama	970
KEDM	b. Lake Faribault	950
KEDN	b. Lake Fariston	950
KEDP	b. Lake Farley	950
KEDQ	b. West Maximus	1012
KEDR	b. Western Glen	1011
KEDT	b. West Quechee	1013
KEDV	b. West Nosska	1013
KEDX	b. West Hardaway	1011
KEDZ	b. West Hargrave	1011
KEFB	b. Sac City	983
KEFC	b. West Carnifax	1010
KEFD	b. Bar Harbor	903
KEFF	b. Tanka	1003
KEFJ	b. Copalgrove	918
KEFK	b. Cerro Gardo	912
KEFL	b. Chamberino	912
KEFM	b. Lake Inaha	953
KEFN	b. Lake Friar	951
KEFP	b. Lake Frio	951
KEFQ	b. Western Knight	1011
KEFR	b. Ossining	971
KEFS	b. West Harlan	1011
KEFT	b. City of Eureka	914
KEFX	b. West Harshaw	1011
KEFZ	b. West Harts	1011
KEGB	b. Morganza	963
KEGC	b. Bristol	907
KEGF	b. Eclipse	927
KEGG	b. Chamblee	912
KEGJ	b. Chaparel	912
KEGK	b. Chantier	912
KEGL	b. Lake Foxcraft	951
KEGM	b. Dirigo	923
KEGN	b. Lake Frolono	951
KEGP	b. Lake Frugality	951
KEGQ	b. Saluda	983
KEGR	b. Lake Frohna	951
KEGS	b. West Hartland	1011
KEGT	b. West Hartley	1011
KEGX	b. West Hassayampa	1011
KEJB	b. Kokomo	947
KEJD	b. Easterling	926
KEJF	b. Western Ally	1010
KEJG	b. Lake Fraichur	951
KEJJ	b. Lake Fraley	951
KEJK	b. Lake Grainger	952
KEJL	b. Lake Grama	952
KEJN	b. Lake Fanbush	949
KEJP	b. Lake Faulk	950
KEJQ	b. Cabegon	908
KEJS	b. West Amargosa	1009
KEJT	b. William M. Mills	1014
KEJV	b. Faraby	930
KEJX	b. Transportation	1005
KEKB	b. East Wind	927
KEKC	b. Norma	968
KEKD	b. West Cobalt	1010
KEKF	b. Berela	905
KEKG	b. Lake Grampian	952
KEKJ	b. Lake Grampus	952
KEKL	b. Saguache	983
KEKM	b. Lake Fansdale	949
KEKN	b. Lake Fanquier	949
KEKP	b. Lake Furlough	951
KEKQ	b. Castle Wood	911
KEKR	b. Homestead	940
KEKS	b. Tartar	1003
KEKT	b. Oscoda	971
KEKV	b. Neabsco	966
KEKX	b. Batanes	903
KEKZ	b. Bluffton	906
KELB	b. North Pole	968
KELC	b. Polar Star	975
KELD	b. Albatross KELD	898
KELG	b. Buchannon	908
KELJ	b. Berea	905
KELK	b. West Elcajon	1010
KELM	b. Lake Fernando	950
KELN	b. Lake Ferrona	950
KELQ	b. Prusa	976
KELR	b. Cochin	916
KELS	b. Damacan	921
KELV	b. Oback	969
KELX	b. Oyaka	971
KELZ	b. Nawitka	966
KEMC	b. Awonsdaw	902
KEMD	b. Birchleaf KEMD	905
KEMG	b. Susanna II	1000
KEMJ	b. Panay	972
KEMK	b. Hoxie	940
KEML	b. Jacox	943
KEMM	b. Covalt	919
KEMN	b. Covedale	919
KEMP	b. Covena	919
KEMR	b. Oraton	970
KEMX	b. West Vaca	1013
KEMZ	b. Ballenas	903
KENB	b. Tyee KENB	1006
KENC	b. East Cape	926
KEND	b. Triumph	1005
KENF	b. Yaquina	1016
KENG	b. West Avenal	1009
KENJ	b. West Compo	1010
KENK	b. West Modus	1012
KENL	b. Boone	906
KENM	b. Coverun	919
KENN	b. Cowan	919
KENP	b. Lake Elkwood	949
KENQ	b. Ballew	903
KENR	b. Itompa	942
KENS	b. Cabrille	909
KENV	b. Ballcamp	903
KENX	b. Clincho	915
KENZ	b. Banaran	903
KEPB	b. Fort Leavenworth	931
KEPD	b. Diablo	923
KEPF	b. Mercer	961
KEPG	b. Agwistar	897
KEPJ	b. Brevard	907
KEPK	b. Briarcliff	907
KEPL	b. Aledo	898
KEPM	b. Lake Elkwater	949
KEPN	b. Lake Ellendale	949
KEPP	b. Lake Ellenorah	949
KEPQ	b. Proctor	976
KEPR	b. Sahale	983
KEPS	c. Lazy Bay, Alaska	561
KEPT	b. Saco	983
KEPV	b. Wallingford	1008
KEPX	b. Alcis	898

		PAGE
KEPZ	*b.* Alector	898
KEQB	*b.* Dallas KEQB	921
KEQC	*b.* Barugo	903
KEQD	*b.* Bolikow	906
KEQF	*b.* Banicaa	903
KEQG	*b.* Baldridge	903
KEQJ	*b.* Baldrock	903
KEQK	*b.* Belvidere	905
KEQM	*b.* Lake Ellerslie	949
KEQN	*b.* Lake Ellicott	949
KEQP	*b.* Lake Festinia	950
KEQQ	*b.* Aculec	896
KEQR	*b.* Galahad	933
KEQV	*b.* Pisco	975
KEQX	*b.* Salaverry	983
KERD	*b.* Katonah	945
KERF	*b.* Star of Greenland	990
KERG	*b.* Shooters Island	986
KERJ	*b.* West Erral	1011
KERL	*b.* Ganeri	933
KERM	*b.* Lake Festus	950
KERN	*b.* Lake Fibre	950
KERP	*b.* Lake Felding	950
KERQ	*b.* Yesoking	1017
KERR	*b.* Benoni	905
KERT	*b.* Bethelridge	905
KERX	*b.* Miller County	962
KESB	*b.* Lake Foxboro	951
KESC	*b.* Sacandaga	983
KESD	*b.* Castle Point	911
KESF	*b.* Arambi	900
KESG	*b.* Sapinero	984
KESJ	*b.* West Carruth	1010
KESK	*b.* Lake Flovilla	951
KESL	*b.* Cowardin	919
KESM	*b.* Lake Fife	950
KESN	*b.* Lake Figaret	950
KESP	*b.* Lake Fighting	950
KESQ	*b.* Bidwell	905
KESR	*b.* Hampton Roads	937
KESV	*b.* City of Freeport	914
KESZ	*b.* Henry Clay	939
KETD	*b.* Quemakoning	976
KETF	*b.* Esopus	929
KETG	*b.* Braddock	907
KETJ	*b.* Moss Point	964
KETK	*b.* Woyaca	1016
KETL	*b.* Booneteere	906
KETM	*b.* Askawake	901
KETN	*b.* Edgehill	927
KETP	*b.* Edgemont	927
KETQ	*b.* Arundel KETQ	901
KETR	*b.* Aspenhill	901
KETS	*b.* Boxbutte	906
KETT	*b.* Boykin	907
KETX	*b.* Georgina Rolph	934
KETZ	*b.* Annetta Rolph	900
KEVB	*b.* Osawatomie	971
KEVC	*b.* Zavalla	1017
KEVD	*b.* West Corum	1010
KEVF	*b.* Edgemoor	927
KEVG	*b.* Eldena	928
KEVJ	*b.* Fort Seward	931
KEVL	*b.* Grayling	935
KEVM	*b.* Nishmaha	967
KEVN	*b.* Osaqumsick	971
KEVP	*b.* Ozette	971
KEVR	*b.* Hartwood	938
KEVS	*b.* Chappell	912

		PAGE
KEVT	*b.* Schodack	985
KEVV	*b.* Schoharie	985
KEVX	*b.* Tollard	1004
KEVZ	*b.* Lake Faresman	950
KEXB	*b.* McKeesport	960
KEXF	*b.* West Munham	1012
KEXG	*b.* West Nohno	1013
KEXJ	*b.* West Togus	1013
KEXK	*b.* West Totant	1013
KEXL	*b.* Lake Folcroft	951
KEXM	*b.* Wawalona	1009
KEXN	*b.* Moline	963
KEXP	*b.* Cineas	914
KEXQ	*b.* South Bend	988
KEXR	*b.* Grand Haven	935
KEXS	*b.* Milwaukee	962
KEXT	*b.* Peter H. Crowell	974
KEXV	*b.* Hoven	940
KEXX	*b.* West Cajoot	1009
KEXZ	*b.* Glymont	935
KEZB	*b.* Lake Sapor	954
KEZC	*b.* Lake Fonda	951
KEZD	*b.* Lake Fontana	951
KEZF	*b.* Lake Fontanet	951
KEZJ	*b.* Lake Gilboa	952
KEZK	*b.* Lake Gilpen	952
KEZL	*b.* Lake Gilta	952
KEZM	*b.* West Harcuvar	1011
KEZN	*b.* West Hembrie	1011
KEZP	*b.* West Hematite	1011
KEZQ	*b.* Glyndon	935
KEZR	*b.* West Celina	1010
KEZT	*b.* Gray Eagle	935
KEZX	*b.* Mannahocking	958
KEZZ	*b.* Poughkeepsie	975
KFAI	*b.* Glendola	834
KFAO	*b.* Glendoyle	935
KFEO	*b.* Monaha	963
KGAE	*b.* New Windsor	967
KGOE	*b.* Lake Harney	953
KGUE	*b.* Caribbean	910
KGUI	*b.* Apex	900
KIBB	*b.* Lake Glebe	952
KIBC	*b.* Silverbrook	986
KIBD	*b.* Shenandoah	986
KIBF	*b.* Milwaukee Bridge	962
KIBG	*b.* National Bridge	966
KIBJ	*b.* Passaic Bridge	973
KIBK	*b.* Opequan	970
KIBL	*b.* Masca	959
KIBM	*b.* Wisconsin Bridge	1015
KIBN	*b.* S. Malta	1002
KIBP	*b.* Woodman	1016
KIBQ	*b.* Saugus	984
KIBR	*b.* Craftsman	919
KIBS	*b.* Braxton	907
KIBT	*b.* Corvallis	918
KIBX	*b.* Wonahbe	1015
KIBZ	*b.* Byfield	908
KICD	*b.* Dardania	921
KICF	*b.* Datis	921
KICG	*b.* Dertona	922
KICJ	*b.* Diana KICJ	923
KICM	*b.* Edgewood	927
KICN	*b.* Eldridge	928
KICP	*b.* West Islay	1012
KICQ	*b.* West Isleta	1012
KICR	*b.* Gaffney	932
KICS	*b.* Zarembo	1017

		PAGE
KICT	*b.* Sea Bird	985
KICV	*b.* Gunston Hall ..	936
KICX	*b.* Alta..	899
KICZ	*b.* Admiral Evans ..	896
KIDB	*b.* Lake Granby ..	962
KIDC	*b.* Satartia	984
KIDD	*b.* West Alcoz ..	1009
KIDF	*b.* Hegira	938
KIDJ	*b.* Mulpua	964
KIDK	*b.* Borad	906
KIDL	*b.* Genesee KIDL ..	934
KIDM	*b.* Anniston	900
KIDN	*b.* Chattanooga KIDN	913
KIDP	*b.* Louisville Bridge ..	957
KIDQ	*b.* Schoodic	985
KIDR	*b.* Romulus	980
KIDS	*b.* Lake Canaveral ..	948
KIDT	*b.* Barrallton	903
KIDV	*b.* Waukau	1009
KIDX	*b.* Waukegan	1009
KIDZ	*b.* Orleans KIDZ ..	971
KIFB	*b.* West Irmo.. ..	1012
KIFC	*b.* Hukey	941
KIFD	*b.* West Cavanal ..	1010
KIFF	*b.* Alderman	898
KIFG	*b.* Favorite KIFG ..	930
KIFJ	*b.* Kishacoquillas ..	947
KIFK	*b.* Chautaugua ..	913
KIFL	*b.* Delphine	922
KIFN	*b.* Humrick	941
KIFP	*b.* West Conob ..	1010
KIFQ	*b.* Bound Brook ..	906
KIFR	*b.* Barranca KIFR ..	903
KIFS	*b.* Kimta	946
KIFT	*b.* Angelina	899
KIFV	*b.* Andrea F. Luckenbach	899
KIFX	*b.* Youngstwon ..	1017
KIFZ	*b.* Lorain	957
KIGB	*b.* Lake Glencoe ..	952
KIGC	*b.* Humacenna ..	941
KIGD	*b.* Hulver	941
KIGF	*b.* Seekonk	985
KIGG	*b.* Walden	1008
KIGJ	*b.* Director KIGJ ..	923
KIGK	*b.* Intan	942
KIGL	*b* Polybius	975
KIGM	*b.* Lake Farlin ..	950
KIGN	*b.* Atlantus	902
KIGR	*b.* Blair	905
KIGR	*b.* Sanaelisa	1001
KIGS	*b.* Harry Luckenbach	937
KIGT	*b.* Bessemer	905
KIGV	*b.* Battonville.. ..	904
KIGX	*b.* Yaklok	1016
KIGZ	*b.* Ashbee	901
KIJB	*b.* Lake Candelaria ..	948
KIJC	*b.* Balsam	903
KIJD	*b.* Barrenfark	903
KIJF	*b.* Barryton	903
KIJG	*b.* Wicasta	1014
KIJJ	*b.* Sabotawan	983
KIJK	*b.* Kisnop	947
KIJL	*b.* Edellyn	927
KIJM	*b.* Schroon	985
KIJN	*b.* Knoxville	947
KIJP	*b.* Montgomery KIJP	963
KIJQ	*b.* Hoxbar	940
KIJR	*b.* Barstow	903
KIJS	*b.* Butterfield	908
KIJT	*b.* Buttercup	908
KIJV	*b.* Bethlehem Bridge ..	905
KIJX	*b.* Brasher	907
KIJZ	*b.* Dade County ..	921
KIKB	*b.* Hillsborough County	939
KIKC	*b.* Jackson	943
KIKD	*b.* Johnson City ..	944
KIKG	*b.* S. Johns County ..	1001
KIKJ	*b.* S. Augustine ..	1001
KIKK	*b.* Shortsville	986
KIKL	*b.* Colorado Springs ..	917
KIKL	*b.* Worcester	1016
KIKM	*b.* West Kasson ..	1012
KIKN	*b.* Mendora	961
KIKP	*b.* Moosabee	963
KIKQ	*b.* Ambridge	899
KIKR	*b.* Clairton	915
KIKT	*b.* Evansville ..	929
KIKV	*b.* Bon Secour.. ..	906
KIKX	*b.* West Islip	1012
KIKZ	*b.* Clio	915
KILB	*b.* Clodia	915
KILC	*b.* Himoto	939
KILF	*b.* Elmsport	928
KILG	*b.* Edisto	927
KILL	*b.* City of Spokane ..	915
KILM	*b.* Waxahachie ..	1009
KILN	*b.* Neshaminy.. ..	966
KILP	*b.* Meriden	961
KILQ	*b.* Shaume	986
KILR	*b.* Scantic	984
KILT	*b.* West Calumb ..	1010
KILV	*b.* Ipswich	942
KILX	*b.* Manasses ..	963
KILZ	*b.* West Cawthon ..	1010
KIMB	*b.* Tuckanuck	1005
KIMC	*b.* Tripp	1005
KIMD	*b.* Deerlodge	921
KIMG	*b.* West Chetac ..	1010
KIMJ	*b.* Cushnoc	920
KIML	*b.* S. Leonora	1002
KIMM	*b.* Winyah	1015
KIMN	*b.* Salvation Lass ..	983
KIMP	*b.* Pontchartrain ..	975
KIMQ	*b.* East Side	927
KIMR	*b.* Dochet	923
KIMS	*b.* Burnwell	908
KIMT	*b.* Mount Evans ..	964
KIMV	*b* .Lake Cannonsburg	948
KIMX	*b.* Orinoco	970
KIMZ	*b.* Pipestone County ..	975
KINB	*b.* Ogontz	969
KINC	*b.* Hyannis	941
KINF	*b.* Costigan	918
KING	*b.* Watertown	1009
KINJ	*b.* Lake Fabyan ..	949
KINK	*b.* Lake Glasco ..	952
KINL	*b.* Pere Marquette 8 ..	974
KINM	*b.* Lehigh	955
KINN	*b.* West Ison	1012
KINP	*b.* West Hepburn ..	1011
KINQ	*b.* Eelbeck	928
KINR	*b.* Olen..	970
KINS	*b.* Boston Bridge ..	906
KINT	*b.* Bay Head	904
KINV	*b.* Calno	909
KINX	*b.* Davidson County ..	921
KINZ	*b.* Pawtucket	973

		PAGE
KJIE	*b.* Walter A. Luckenbach	1008
KJII	*b.* Muscatine	965
KJIO	*b.* Paul H. Harwood..	973
KJIU	*b.* Carib KJIU ..	910
KJOA	*b.* Faith	929
KJOE	*b.* W. M. Irish ..	1015
KJOI	*b.* Sturgeon Bay ..	990
KJOO	*b.* West Bridge ..	1009
KJOU	*b.* Tuckahoe	1005
KJUA	*b.* Ice King	941
KJUE	*b.* Radnor	978
KJUI	*b.* Point Lobos ..	975
KJUO	*b.* West Alesk ..	1009
KJUU	*b.* West Apaum ..	1009
KKAA	*c.* Sulzer, Alaska ..	562
KKAE	*c.* Nushagak, Alaska..	561
KKAI	*c.* Hawk Inlet, Alaska	560
KKAO	*c.* Kussilof, Alaska ..	561
KKAU	*b.* Avondale	902
KKEA	*b.* Cabeza	909
KKEE	*b.* Nanking	965
KKEI	*b.* City of Sydney ..	915
KKEO	*b.* Waukesha	1009
KKEU	*b.* Mariners Harbor ..	959
KKIA	*b.* Daca	921
KKIE	*b.* Forster	931
KKII	*b.* Eyota	929
KKIO	*b.* Wasco	1009
KKIU	*b.* Nacogdockes ..	965
KKOA	*b.* Biran	905
KKOE	*b.* Lake Annette ..	948
KKOU	*b.* Wakanna	1008
KKUA	*b.* Wayucan	1009
KKUI	*b.* William G. Mather	1014
KLAA	*b.* Luella	957
KLAE	*b.* Overbrook ..	971
KLAI	*b.* Afrinnia	897
KLAO	*b.* Lake Crystal ..	949
KLAU	*b.* Lake Winona ..	954
KLEA	*b.* Lake Maurepas ..	953
KLEE	*b.* Lake St. Regis ..	954
KLEI	*b.* Lake Allen ..	948
KLEO	*b.* Lake Clear	948
KLEU	*b.* Lake Pewaukee ..	954
KLIA	*b.* Lake Otisco ..	953
KLIE	*b.* Lake Como ..	948
KLIU	*b.* Lake Sunapee ..	954
KLOE	*b.* Lake Hemlock ..	953
KLOI	*b.* Lake Hurst ..	953
KLOO	*b.* Lake Lida	953
KLOU	*b.* Lake Shawano ..	954
KLUA	*b.* Lake Capens ..	948
KLUE	*b.* Lake Sebago ..	954
KLUI	*b.* Lake Cayuga ..	948
KLUO	*b.* Lake Ennis.. ..	949
KLUU	*b.* Agrista	897
KMAA	*b.* Admiral Nicholson	897
KMAI	*b.* Catherine D. ..	911
KMAU	*b.* Ampetco	899
KMEI	*b.* Orizaba	971
KMEO	*b.* Cletus Schneider ..	915
KMEU	*b.* Pasadena	973
KMIE	*b.* Cape Henry ..	909
KMII	*b.* Masuda	959
KMIO	*b.* Willimantic ..	1015
KMIU	*b.* W. M. Burton ..	1015
KMOI	*b.* Eldorado	928
KMOO	*b.* Oakland	969

		PAGE
KMOU	*b.* Edward Pierce ..	928
KMUA	*b.* Lake Lasang ..	953
KMUE	*b.* Lake Larga ..	953
KMUI	*b.* Geo. W. Barnes ..	934
KMUO	*b.* Fassett	930
KMUU	*b.* Lake Flume ..	951
KNAA	*b.* Western Sea ..	1011
KNAE	*b.* Western Cohas ..	1010
KNAI	*b.* Western City ..	1010
KNAO	*b.* Western Chief ..	1010
KNAU	*b.* Westford	1011
KNEA	*b.* Western Spirit ..	1011
KNEE	*b.* S. Tecla	1002
KNEI	*b.* Quinault	976
KNEU	*b.* Wiskah	1015
KNII	*b.* Cheron	913
KNIO	*b.* Beloit	905
KNOA	*b.* Manada	958
KNOE	*b.* Boulton	906
KNOI	*b.* Bancroft KNOI ..	903
KNOU	*b.* Bonnafon	906
KNUA	*b.* Fonduco	931
KNUI	*b.* Yakima	1016
KNUO	*b.* Mazama	960
KNUU	*b.* Boxley	906
KOBB	*b.* Shannock	986
KOBC	*b.* Ruby	980
KOBD	*b.* Orani	970
KOBF	*b.* Vanada	1007
KOBG	*b.* Editor	927
KOBJ	*b.* Deroche	922
KOBK	*b.* West Katan ..	1012
KOBL	*b.* Lake Ellijay ..	949
KOBM	*b.* Willpolo	1015
KOBP	*b.* Bird City	905
KOBQ	*b.* Gonzalia	935
KOBR	*b.* Barwick	903
KOBS	*b.* Bartolome.. ..	903
KOBT	*b.* Lake Inglenook ..	953
KOBV	*b.* Baldhill	903
KOBX	*b.* Noshico	964
KOBZ	*b.* Lake Elon	949
KOCB	*b.* Lake Savus ..	954
KOCC	*b.* Epitacio Pessoa ..	929
KOCD	*b.* Texarkana	1003
KOCF	*b.* Nakatav	967
KOCG	*b.* Lake Fiscus ..	950
KOCJ	*b.* Aquilo KOCJ ..	900
KOCK	*b.* West Pocasset ..	1013
KOCL	*b.* Elkhorn	928
KOCM	*b.* Marsodak	959
KOCN	*b.* Federal Bridge ..	930
KOCP	*b.* Continental Bridge	917
KOCQ	*b.* Clark Mills	915
KOCS	*b.* Lake Girardeau ..	952
KOCT	*b.* Hercules KOCT ..	939
KOCV	*b.* West Saginaw ..	1013
KOCX	*b.* West Jaffrey ..	1012
KOCZ	*b.* Lake Ellsworth ..	949
KODB	*b.* Nobles	967
KODC	*b.* Sunbeam	1000
KODD	*b.* Lake Fisher ..	950
KODF	*b.* West Caddoa ..	1009
KODG	*b.* Siletz	986
KODK	*b.* Hathaway ..	938
KODL	*b.* Menominee KODL	961
KODN	*b.* Endicotte	928
KODQ	*b.* Hulaco	941
KODR	*b.* Salem County ..	983

Call	Name	PAGE
KODS	*b.* Bellemina	905
KODT	*b.* Dewey	922
KODV	*b.* Hog Island	940
KODX	*b.* Dillwyn	923
KODZ	*b.* Ophis	970
KOFC	*b.* Bellhaven	905
KOFD	*b.* Anaconda	899
KOFF	*b.* Auditor	902
KOFG	*b.* Sunshine	1000
KOFJ	*b.* H. F. Morse	939
KOFK	*b.* Elkton	928
KOFL	*b.* Chepadoa	913
KOFM	*b.* Lake Ellithorpe	949
KOFN	*b.* Cockaponset	916
KOFP	*b.* Lake Ellsbury	949
KOFQ	*b.* Lake Elmhurst	949
KOFR	*b.* Basford	903
KOFS	*b.* Bascobel	903
KOFT	*b.* Bensalem	905
KOFV	*b.* Lake Elpueblo	949
KOFX	*b.* Cook KOFX	918
KOFZ	*b.* Coquit	918
KOGB	*b.* Independent Bridge	941
KOGC	*b.* Hagan	937
KOGC	*b.* Lackawanna Bridge	948
KOGD	*b.* Moosehausic	963
KOGF	*b.* Kootenai	947
KOGJ	*b.* Nockum	967
KOGK	*b.* Escambia	929
KOGL	*b.* West Ira	1012
KOGM	*b.* Storm King KOGM	990
KOGN	*b.* Brave Coeur	907
KOGP	*b.* Hadnot	937
KOGQ	*b.* Irvington	942
KOGR	*b.* Lake Fairport	949
KOGS	*b.* Lake Flatonia	951
KOGT	*b.* Lake Flanders	950
KOGV	*b.* Lake Gebhart	952
KOGX	*b.* Merry Mount	961
KOGZ	*b.* Commissioner	917
KOJB	*b.* York Harbor	1017
KOJD	*b.* Sinsinawa	987
KOJG	*b.* Jacksonville	943
KOJJ	*b.* Galata	951
KOJK	*b.* Hanover	937
KOJL	*b.* Cripple Creek	919
KOJM	*b.* Lake Onawa	953
KOJN	*b.* Westeria	1015
KOJP	*b.* Lake Favonia	950
KOJQ	*b.* Lake Fitch	950
KOJR	*b.* Chickasaw	913
KOJS	*b.* Magmeric P	957
KOJT	*b.* Lake Galien	957
KOJV	*b.* Portsmouth KOJV	975
KOJX	*b.* Lake Galewood	951
KOJZ	*b.* Lake Gaither	951
KOKC	*b.* Northern Star	968
KOKD	*b.* Bellerose	905
KOKF	*b.* Bellepline	905
KOKG	*b.* Moositauke	963
KOKJ	*b.* Eider KOKJ	928
KOKK	*b.* Iceland	941
KOKL	*b.* Kaweah	945
KOKM	*b.* Daniel Webster	921
KOKN	*b.* Antigone	900
KOKP	*b.* Crisfield	919
KOKQ	*b.* Lake Elrio	949
KOKR	*b.* Inspector	942
KOKS	*b.* Lake Gera	952
KOKT	*b.* Bethnor	905
KOKV	*b.* Kaleen	945
KOKX	*b.* Kolda	947
KOKZ	*b.* Lake Fithian	950
KOLB	*b.* Aryan	901
KOLC	*b.* Orient KOLC	970
KOLG	*b.* Tuwelanka	1006
KOLJ	*b.* Lake Faxon	950
KOLK	*b.* Lake Felden	950
KOLL	*b.* Clavarack	915
KOLM	*b.* Balcatta	903
KOLN	*b.* Susquehanna KOLN	1000
KOLO	*b.* Antonia	900
KOLP	*b.* Cathlamet	911
KOLS	*b.* Chicomico	913
KOLT	*b.* Effingham	928
KOLV	*b.* Palisades	971
KOLX	*b.* Cranford KOLX	919
KOLZ	*b.* Lake Getaway	952
KOMB	*b.* Lake Gert	952
KOMC	*b.* Lake Flattery	951
KOMD	*b.* Deuel	922
KOMF	*b.* Bartholomew	903
KOMG	*b.* Afoundria	897
KOMG	*b.* Whitemarsh	1013
KOMJ	*b.* Penguin	973
KOMK	*b.* Lycoming	957
KOML	*b.* J. R. Gordon	944
KOMM	*b.* Scottsburg	985
KOMN	*b.* S. Antonio KOMN	1001
KOMP	*b.* Coahoma County	915
KOMS	*b.* Henry County	939
KOMT	*b.* Effna	928
KOMV	*b.* Montague	963
KOMX	*b.* Peekskill	973
KOMZ	*b.* Coskata	918
KONB	*b.* Cushnet	918
KONC	*b.* Cuttyhunk	921
KOND	*b.* Indiana Bridge	941
KONG	*b.* Margus	959
KONJ	*b.* Massillon Bridge	959
KONK	*b.* Northwestern Bridge	968
KONL	*b.* Fargo	930
KONM	*b.* Crosse (La)	948
KONN	*b.* Sioux Falls	987
KONP	*b.* Lansdowne	955
KONQ	*b.* Andrew Jackson	899
KONR	*b.* Antietam	900
KONR	*b.* Ashland County	901
KONS	*b.* Lake Strymon	954
KONT	*b.* Lake Elsmere	949
KONV	*b.* Lake Filbert	950
KONX	*b.* Detroit-Wayen	922
KONZ	*b.* City of Alton	914
KOPB	*b.* Lake Fernalda	950
KOPC	*b.* Bavington	904
KOPD	*b.* Dannedaike	921
KOPF	*b.* Massick	959
KOPJ	*b.* Terre Haute	1003
KOPK	*b.* Circinus	914
KOPL	*b.* Corvus	918
KOPM	*b.* Nika	967
KOPP	*b.* Eastern Breeze	926
KOPQ	*b.* Bellflower	905
KOPR	*b.* Kearny	945
KOPS	*b.* Coolcha	918
KOPT	*b.* Eglantine KOPT	928
KOPV	*b.* Lake Fillion	950
KOPX	*b.* Mopang	963

		PAGE			PAGE
KOPZ	*b.* Centaurus	911	KOVF	*b.* Amcross	899
KOQD	*b.* Hagood	937	KOVG	*b.* Lake Elmsford ..	949
KOQF	*b.* Tri Mountain ..	1005	KOVJ	*b.* Dilworth	923
KOQJ	*b.* Casey	911	KOVL	*b.* Lake Fandango ..	949
KOQK	*b.* Coldbrook	916	KOVM	*b.* Robin Adair ..	980
KOQL	*b.* George C. Greer ..	934	KOVN	*b.* E. A. Morse.. ..	926
KOQM	*b.* Standtug No. 1 ..	989	KOVP	*b.* Clarksburg	915
KOQP	*b.* McCreary County ..	960	KOVQ	*b.* Elfay	928
KOQQ	*b.* West Ivis	1012	KOVR	*b.* Abercos	896
KOQR	*b.* Kingfisher	946	KOVS	*b.* Lake Fandon ..	949
KOQS	*b.* Egremont ..	928	KOVT	*b.* Cœur d'Alene ..	916
KOQT	*b.* Quinnipiac	977	KOVV	*b.* Coelleda	916
KOQV	*b.* Caldas	909	KOVX	*b.* Tampa	1003
KOQX	*b.* Nipmuc	967	KOVZ	*b.* I. J. Merritt ..	941
KORB	*b.* West Mingo ..	1012	KOXB	*b.* Haslehurst	938
KORC	*b.* Macomet	957	KOXC	*b.* Suwied	1000
KORD	*b.* Sundance	1000	KOXD	*b.* Tashmoo	1003
KORF	*b.* Noccalula	967	KOXF	*b.* Tekoa	1003
KORG	*b.* Cethana	912	KOXG	*b.* Toledo Bridge ..	1004
KORJ	*b.* Challamba	912	KOXJ	*b.* Tona	1005
KORK	*b.* Dryden KORK ..	923	KOXK	*b.* Tonesit	1005
KORL	*b.* Haleakala	937	KOXL	*b.* Tuladi	1005
KORM	*b.* Jadden	943	KOXM	*b.* Vincennes Bridge ..	1007
KORN	*b.* Rock Island Bridge	980	KOXN	*c.* Pirate Cove, Alaska	562
KORP	*b.* Monomac	963	KOXP	*b.* Von Steuben ..	1007
KORQ	*b.* Vinton County ..	1007	KOXQ	*b.* Agememnon ..	897
KORS	*b.* Manham	958	KOXR	*b.* Tampico	1003
KORT	*b.* Hancock County ..	937	KOXS	*b.* West Jessup ..	1012
KORV	*b.* Wildwood	1014	KOXT	*b.* Robin Gray ..	980
KORX	*b.* Cliffwood	915	KOXX	*b.* Steelmaker	990
KOSB	*b.* Widgeon	1014	KOXY	*b.* Roanoke	979
KOSC	*c.* Tenekee	563	KOXZ	*b.* Steel Age	990
KOSD	*b.* Nile KOSD ..	967	KOZB	*b.* City of Omaha ..	915
KOSF	*b.* Monroe	963	KOZC	*b.* Aeolus	897
KOSG	*b.* Rapidan KOSG ..	978	KOZD	*b.* Rockport	980
KOSK	*b.* Danvers	921	KOZF	*b.* Tenafly	1003
KOSJ	*b.* Danville	921	KOZG	*b.* Moravia Bridge ..	963
KOSL	*b.* West Kader ..	1012	KOZJ	*b.* West Niger ..	1012
KOSM	*b.* City of St. Joseph..	915	KOZK	*b.* West Hika ..	1011
KOSN	*b.* John Roach ..	944	KOZL	*b.* Quaker City ..	976
KOSP	*b.* Sapona	984	KOZM	*b.* Miskianza	962
KOSQ	*b.* Lake Treba ..	954	KOZN	*b.* Minooka	962
KOSR	*b.* Lake Elsah ..	949	KOZP	*b.* Vigilant	1007
KOSS	*b.* John Adams ..	944	KOZQ	*b.* City of Berkeley ..	914
KOST	*b.* Chester Valley ..	913	KOZR	*b.* Culburra	920
KOSV	*b.* Kenowis	946	KOZS	*b.* West Ivan	1012
KOSX	*b.* Hartford KOSX ..	938	KOZT	*b.* Lake Elmwood ..	949
KOSZ	*b.* Curlew	920	KOZV	*b.* William H. Webb..	1014
KOTB	*b.* Lake Falun ..	949	KOZX	*b.* Norumbega ..	968
KOTC	*b.* Teal	1003	KOZZ	*b.* Collamer	916
KOTD	*b.* Cross Keys.. ..	919	KPAA	*b.* Point Judith ..	975
KOTF	*b.* Mitchell	962	KPAE	*b.* Toka	1004
KOTG	*b.* West Jena	1012	KPAI	*b.* Biloxi	905
KOTJ	*b.* Lake Slavi ..	954	KPAO	*b.* Kazota	945
KOTK	*b.* West Neris.. ..	1012	KPAU	*b.* Blandon	905
KOTL	*b.* Vinita	1007	KPEA	*b.* Boilston	906
KOTM	*b.* Robin Hood ..	980	KPEO	*b.* Moritz	963
KOTN	*b.* West Hesseltine ..	1011	KPEU	*b.* Moraine	964
KOTP	*b.* Wisla	1015	KPGO	*b.* Minnewawa ..	962
KOTQ	*b.* Red Mountain ..	979	KPIE	*b.* Pezuta	887
KOTR	*b.* West Montop ..	1012	KPII	*b.* Sewickley ..	985
KOTS	*b.* Wild Goose.. ..	1014	KPIU	*b.* Issaquena	942
KOTT	*b.* Lake Fenn ..	950	KPOA	*b.* Blue Eagle ..	906
KOTV	*b.* Franklin County ..	931	KPOI	*b.* Lonoke	956
KOTX	*b.* Delanson	922	KPOU	*b.* Salmon	983
KOTZ	*b.* Benowa	905	KPUA	*b.* Makanda	958
KOVB	*b.* Gulftrade	936	KPUE	*b.* Belding	904
KOVC	*b.* Lake Tippah ..	954	KPUI	*b.* Kineo	946
KOVD	*b.* Maquan	959	KPUO	*b.* Benzonia	905

		PAGE			PAGE
KQAI	*b.* Wallowa	1008	KTIO	*b.* Fresno	932
KQAO	*b.* Calala	909	KTIU	*b.* Lake Blanchester	948
KQEA	*b.* Clackamas	915	KTOA	*b.* Lake Narka	953
KQEE	*b.* Anoka	900	KTOE	*b.* Mary KTOE	959
KQEI	*b.* Bell Brook	904	KTOI	*b.* Catherine	911
KQEO	*b.* Lake Charlotte	948	KTOO	*b.* Lake Yemassee	954
KQIE	*b.* Farnam	930	KTOU	*b.* Lake Markham	953
KQII	*b.* S. Olivia	1002	KTUA	*b.* Lake Ledan	953
KQIO	*b.* Deranof	922	KTUE	*b.* Lake Bledsoe	948
KQIU	*b.* West Ekonk	1010	KTUI	*b.* Lake Pepin	954
KQOA	*b.* Anacortes	899	KTUO	*b.* Sagadahoc	983
KQOE	*b.* Delight	922	KTUU	*b.* Lake Pachuta	953
KQOI	*b.* Western Light	1011	KUBB	*b.* Cold Harbor	916
KQOO	*b.* Western Maid	1011	KUBC	*b.* Laramie KUBC	955
KQUE	*b.* Lancaster KQUE	955	KUBD	*b.* Claremont	915
KQUO	*b.* Lake Chelan	948	KUBF	*b.* S. Diego	1001
KQUU	*b.* West Gambo	1011	KUBG	*b.* Betterton	905
KRAA	*b.* West Coast	1010	KUBJ	*b.* Liberty Minquas	956
KRAE	*b.* Mauban	960	KUBK	*b.* Bearport	904
KRAI	*b.* Bromela	907	KUBL	*b.* Pawlet	973
KRAO	*b.* Brompton	907	KUBM	*b.* S. Anthony	1001
KRAU	*b.* Bronche	907	KUBN	*b.* Robin Goodfellow	980
KREA	*b.* Cape Romain	909	KUBP	*b.* City of Alma	914
KREE	*b.* Gulfport	936	KUBQ	*b.* Mazatlan	960
KREI	*b.* Lake Washburn	954	KUBR	*b.* Lake Elva	949
KREO	*b.* Lake Mary	953	KUBS	*b.* Indiana Harbor	941
KRIA	*b.* Lake Daraga	949	KUBT	*b.* Lake Feodora	950
KRIE	*b.* Astoria KRIE	901	KUBV	*b.* Higho	939
KRII	*b.* Lake Elsinore	949	KUBX	*c.* Koggiung	560
KRIU	*b.* Liberator	956	KUBZ	*b.* Dellwood	922
KROA	*b.* Blythedale	906	KUCB	*b.* New England	967
KROE	*b.* Anima	899	KUCC	*b.* Plow City	975
KROI	*b.* Wampum	1008	KUCD	*b.* Riverside Bridge	979
KROO	*b.* Wassaic	1009	KUCF	*b.* Virginia Bridge	1007
KROU	*b.* Garibaldi KROU	933	KUCG	*b.* Des Moines Bridge	922
KRUA	*b.* Cresap	919	KUCJ	*b.* Holyoke Bridge	940
KRUE	*b.* Brookwood	907	KUCK	*b.* Wauwatosa	1009
KRUI	*b.* S. Flavia	1001	KUCL	*b.* Hudsonian	941
KRUO	*b.* Wakulla	1008	KUCM	*b.* Lake Ikatan	953
KRUU	*b.* Socony 88	987	KUCN	*b.* Eastern Guide	927
KSAA	*b.* Socony 89	987	KUCP	*c.* Chisik Island	559
KSAE	*b.* Rose Mahoney	980	KUCQ	*b.* City of Alameda	914
KSAI	*b.* Capines	910	KUCR	*b.* Lake Giddings	952
KSAO	*b.* Lake Conesus	949	KUCS	*b.* City of Sherman	915
KSEA	*b.* Absecon	896	KUCV	*b.* City of Flint	914
KSEE	*b.* Mineola	962	KUCX	*b.* Coldwater	916
KSEI	*b.* Eastern Chief	926	KUCZ	*b.* Lake Fillmore	950
KSEO	*b.* Quindnic	976	KUDB	*b.* Brant KUDB	907
KSEU	*b.* Jonancy	944	KUDC	*b.* Tuscan KUDC	1006
KSIE	*b.* Glen White	935	KUDD	*b.* Argon	901
KSII	*b.* Lake Catherine	948	KUDF	*b.* Heron KUDF	939
KSIO	*b.* Argonne	901	KUDG	*b.* West Jester	1012
KSIU	*b.* Lake Benton	948	KUDJ	*b.* Mehanno	961
KSOA	*b.* Polar Sea	975	KUDK	*b.* West Cadron	1009
KSOE	*b.* Lake Eckhart	949	KUDL	*b.* Willsolo	1015
KSOI	*b.* Lake Wimico	954	KUDM	*b.* Lake Elwin	949
KSOO	*b.* Lake Duncan	949	KUDN	*b.* American Press	899
KSOU	*b.* Bylayl	908	KUDP	*b.* Clontarf	915
KSUA	*b.* F. D. Asche	930	KUDQ	*b.* West Himrod	1011
KSUO	*b.* Umatilla	1006	KUDR	*b.* Davenport	921
KTAA	*b.* Alloway	899	KUDS	*b.* Rushville	981
KTAI	*b.* Lake Eliko	949	KUDT	*c.* Pilot Point	562
KTAO	*b.* Lake Frances	951	KUDV	*c.* Becharof	559
KTAU	*b.* Eastern Star	927	KUDX	*b.* Eastern Moon	927
KTEA	*b.* Eastern Sea	927	KUDZ	*b.* Eastern Gale	926
KTEE	*b.* Western Cross	1011	KUFB	*b.* Eastern Knight	927
KTEI	*b.* Winnebago KTEI	1015	KUFC	*b.* Lake Floravista	951
KTEO	*b.* Fort Wright	931	KUFD	*b.* Lake Florian	951
KTIE	*b.* Eastern Sun	927	KUFF	*b.* Lake Floris	951

		PAGE
KUFG	*b.* Lake Flournoy ..	951
KUFJ	*b.* West Nilus.. ..	1013
KUFK	*b.* Great Falls.. ..	935
KUFL	*b.* Cartona	911
KUFM	*b.* Corone	918
KUFN	*b.* Steel Voyager ..	990
KUFQ	*b.* Tern	1003
KUFR	*b.* West Campgaw ..	1010
KUFS	*b.* Snipe	987
KUFT	*b.* Plover	975
KUFX	*b.* Sheldrake	986
KUFZ	*b.* Ossa..	971
KUGB	*b.* Eastern Mariner ..	927
KUGC	*b.* Boobyalla	906
KUGD	*b.* Clearwater	915
KUGF	*b.* Boynton	907
KUGG	*b.* Clemence C. Morse..	915
KUGJ	*b.* Loon	957
KUGK	*b.* Sioux City ..	987
KUGL	*b.* Lake Galisteo ..	952
KUGM	*b.* Ripon ..	979
KUGN	*b.* Lake Haresti ..	953
KUGP	*b.* Seminole KUGP ..	985
KUGQ	*b.* Star of Holland ..	990
KUGR	*b.* Summerleaf ..	999
KUGS	*b.* Blue Triangle ..	906
KUGT	*b.* Jomar	944
KUGV	*b.* Conshohocken ..	917
KUGX	*b.* Mason City ..	959
KUGZ	*b.* Maddequet ..	957
KUJC	*b.* Bayport	904
KUJD	*b.* Baddacock	902
KUJF	*b.* Kerhonkson ..	946
KUJK	*b.* Havilah	938
KUJL	*b.* Ozmo	971
KUJM	*b.* Coot..	918
KUJN	*b.* Osprey KUJN ..	971
KUJP	*b.* Hutchinson.. ..	941
KUJQ	*b.* Ethan Allen ..	929
KUJR	*b.* City of Joliet ..	914
KUJS	*b.* Winston-Salem ..	1015
KUJT	*b.* Eastern Belle ..	926
KUJV	*b.* Eastern Crag ..	926
KUJX	*b.* Liberty Bell ..	956
KUJZ	*b.* Quabbin	976
KUKB	*b.* Aragon KUKB ..	900
KUKC	*b.* Schuylkill	985
KUKD	*b.* East Chicago ..	926
KUKF	*b.* Fort Armstrong ..	931
KUKG	*b.* Anthracite Bridge..	900
KUKJ	*b.* West Jappa ..	1012
KUKK	*b.* Noddle Island ..	967
KUKL	*b.* Pittsburgh Bridge	975
KUKM	*b.* Tancarville.. ..	1003
KUKN	*b.* Louise	957
KUKP	*b.* Mohinkis	963
KUKQ	*b.* Selma	985
KUKR	*b.* Latham	955
KUKS	*b.* Eastern Merchant..	927
KUKT	*b.* Conejos	917
KUKV	*b.* West Hixton ..	1011
KUKX	*b.* Collingsworth ..	916
KULB	*b.* Pinellas	974
KULC	*b.* Chickamauga ..	913
KULD	*b.* Lake Geyser ..	952
KULF	*b.* Fishkill	931
KULG	*b.* Darien	921
KULJ	*b.* Eastern Pilot ..	927
KULK	*b.* Eastern Trader ..	927

		PAGE
KULK	*b.* Otho	971
KULL	*b.* Donald McKay ..	923
KULM	*b.* Ario	901
KULN	*b.* Arizpa	901
KULP	*b.* Toopi	1005
KULQ	*b.* Pylos	976
KULR	*b.* Vallonia	1007
KULS	*b.* Outagamie	971
KULT	*b.* Commack	917
KULV	*b.* S. Juan KULV ..	1001
KULZ	*b.* Lyndonia	957
KUMB	*b.* Lake Ganado ..	952
KUMC	*b.* Utacarbon ..	1006
KUMD	*b.* Staten Island ..	990
KUMF	*b.* Dunsyre	923
KUMG	*b.* Homer	940
KUMJ	*b.* Grebe KUMJ ..	935
KUMK	*b.* Freeport Sulphur No. 5	932
KUML	*b.* Oklahoma City ..	969
KUMM	*b.* West Calera ..	1000
KUMN	*b.* Portola Plumas ..	975
KUMN	*b.* Wheeling Mold ..	1013
KUMQ	*b.* Comerant	917
KUMR	*b.* Colthraps	917
KUMS	*b.* Atlantic Sun ..	902
KUMT	*b.* Solitaire	987
KUMV	*b.* Lake Galucus ..	952
KUMX	*b.* Lake Flag	950
KUMZ	*b.* Lake Hector ..	953
KUNB	*b.* Lake Harminia ..	953
KUNC	*b.* Lake Gunni ..	953
KUND	*b.* Eastern Glade ..	926
KUNF	*b.* Eastern Ocean ..	927
KUNG	*b.* Union Liberty ..	1006
KUNJ	*b.* Evergreen City ..	929
KUNK	*b.* Neshobee	966
KUNL	*b.* Oronoke	971
KUNN	*b.* Jennie R. Morse ..	943
KUNP	*b.* Freeport Sulphur No. 6	932
KUNQ	*b.* Eastern Crown ..	926
KUNR	*b.* Eastern Victor ..	927
KUNS	*b.* City of Vernon ..	915
KUNT	*b.* George B. MacKenzie	934
KUNV	*b.* Winona KUNV ..	1015
KUNZ	*b.* Chickasaw City ..	913
KUPB	*b.* Italia KUPB ..	942
KUPC	*b.* Pinthis	973
KUPD	*b.* Eastern Planet ..	927
KUPF	*b.* Hahatonka ..	937
KUPG	*b.* Greenland	935
KUPJ	*b.* West Cahokia ..	1009
KUPK	*b.* Darden	921
KUPL	*b.* Conness Peak ..	917
KUPN	*b.* Capillo	909
KUPP	*b.* Cubore	920
KUPQ	*c.* Ogden, Utah ..	649
KUPS	*b.* Naugus	966
KUPT	*b.* Waterbury ..	1009
KUPV	*b.* Kehuku	945
KUPX	*b.* Hawarden	938
KUQB	*b.* Fueloil	932
KUQC	*b.* Panoil	972
KUQD	*b.* Crudoil	920
KUQF	*b.* Martha Washington	959
KUQG	*b.* Padnsay	971
KUQJ	*b.* West Nivaria ..	1013
KUQK	*b.* West Keats ..	1012

		PAGE			PAGE
KUQL	*b.* Pulaski	975	KUXJ	*c.* Cebu	618
KUQM	*b.* Vegas (Las) ..	955	KUXK	*c.* Batanagas	618
KUQN	*b.* J. F. Penrose ..	943	KUXM	*c.* Cheboygan	639
KUQP	*b.* Unicoi	1006	KUXN	*c.* Miles City	647
KUQQ	*b.* Conehatta	917	KUXP	*c.* Dallas, Texas ..	639
KUQR	*b.* Everett KUQR ..	929	KUXQ	*c.* Wichita Falls ..	653
KUQS	*b.* Margaret KUQS ..	959	KUXT	*c.* Long Beach, California ..	647
KUQT	*b.* Eastern Dawn ..	926			
KUQX	*b.* Juvigny	945	KUXV	*c.* Pedrocitas, California	649
KUQZ	*b.* Montfaucon ..	963	KVAA	*b.* Lake Osweya ..	953
KURB	*b.* Hinckley	939	KVAE	*b.* Lake Benbow ..	948
KURC	*b.* Cathwood	911	KVAI	*b.* Socony 82	987
KURD	*b.* Arcturus KURD ..	901	KVAO	*b.* Socony 83	987
KURF	*b.* Chappaqua ..	912	KVEA	*b.* Bellota	905
KURG	*b.* Artigas	901	KVEE	*b.* Catawba	911
KURJ	*b.* J. L. Reiss	943	KVEI	*b.* West Galoc ..	1011
KURK	*b.* Fleetco	931	KVEU	*b.* Baladan	903
KURL	*b.* John R. Gibbons ..	944	KVIA	*b.* Balliott	903
KURM	*b.* Eastern Admiral ..	926	KVII	*b.* Montclair	963
KURN	*b.* Manatee	958	KVIO	*b.* Lake Pearl.. ..	953
KURP	*b.* Salaam	983	KVIU	*b.* Allentown	899
KURQ	*b.* Medric	961	KVOE	*b.* Lake Garza ..	952
KURR	*b.* Henry Steers ..	939	KVOI	*b.* Lake Gasper ..	952
KURT	*b.* Brookline	907	KVOO	*b.* Lake Yelverton ..	954
KURV	*b.* Ohonkara	969	KVOU	*b.* Lake Gakona ..	951
KURX	*b.* Eastern Coast ..	926	KVUA	*b.* Lake Ormoc ..	953
KURZ	*b.* Suboatco	999	KVUE	*b.* Lake Akkra ..	948
KUSC	*b.* Sunelseco	1000	KVUO	*b* Lake Gedney ..	952
KUSD	*b.* Huron KUSD ..	941	KVUU	*b.* Lake Hewes ..	953
KUSF	*b.* Capital of Nebraska	910	KXAA	*b.* Lake Alvada ..	948
KUSG	*b.* West Nomentum ..	1013	KXAE	*b.* Lake Delancey ..	949
KUSJ	*b.* Occidental	969	KXAI	*b.* Lake Galera ..	951
KUSK	*b.* City of Reno ..	915	KXAO	*b.* Lake Otsquago ..	953
KUSL	*b.* Pioneer KUSL ..	975	KXAU	*b.* Lake Harris ..	953
KUSM	*b.* John F. Hylan ..	944	KXEA	*b.* Lake Pleasant ..	954
KUSN	*b.* Aquarius	900	KXEE	*b.* Lake Marion ..	953
KUSP	*b.* Crown City.. ..	920	KXEI	*b.* Lake Sanford ..	954
KUSQ	*b.* Eastern Cloud ..	926	KXEO	*b.* Lake Gardner ..	952
KUSR	*b.* Nemaha	966	KXEU	*b.* Lake Ville	954
KUSS	*b.* William A. Whitney	1014	KXII	*b.* Calicorock	909
KUST	*b.* West Camak ..	1010	KXIO	*b.* Calispell	909
KUSV	*b.* Mattole KUSV ..	959	KXIU	*b.* Lake Calistago ..	948
KUSX	*b.* Baccarat KUSX ..	902	KXOA	*b.* Star of Lapland ..	990
KUSZ	*b.* Adria	897	KXOE	*b.* Severance	985
KUTB	*b.* Haxtum	938	KXOI	*b.* Standard KXOI ..	989
KUTC	*b.* West Mahwah ..	1012	KXOU	*b.* Lake Lesa	953
KUTD	*b.* Anna E. Morse ..	899	KXUA	*b.* Lake Geneva ..	952
KUTF	*b.* Eastern Maid ..	927	KXUE	*b.* Eastern Queen ..	927
KUTG	*b.* Delrosa	922	KXUI	*b.* Lake Lillian ..	958
KUTJ	*b.* Pallas	972	KXUU	*b.* Coyote	919
KUTK	*b.* City of Lordsburg ..	914	KZAA	*b.* Middlebury.. ..	961
KUTM	*b.* John P. Reiss ..	944	KZAE	*b.* Lake Linden ..	953
KUTN	*b.* Christabel	913	KZAI	*b.* Lake Winthrop ..	954
KUTP	*b.* Canco	909	KZAO	*b.* Lake Wilson ..	954
KUTQ	*b.* Iroquois KUTQ ..	942	KZAU	*b.* Lake Yahara ..	954
KUTR	*b.* Springfield	989	KZEA	*b.* Keketticut	945
KUTS	*b.* Vacuum	1006	KZEE	*b.* Lake Berdan ..	948
KUTT	*b.* Birmingham City ..	905	KZEI	*b.* Lake Dymer ..	949
KUTV	*b.* Lake Furnas ..	951	KZEO	*b.* Lake Dancey ..	949
KUTX	*b.* Richconcal	979	KZEU	*b.* Lake Agomak ..	948
KUTZ	*b.* Rochester KUTZ ..	980	KZIA	*b.* Lake Aurice ..	948
KUVB	*b.* Eastern Glen ..	926	KZIE	*b.* Lake Winooski ..	954
KUVD	*b.* Argus KUVD ..	901	KZII	*b.* Lake Belnona ..	948
KUVM	*c.* Iloilo	619	KZIO	*b.* Lake Lilicusun ..	953
KUVQ	*c.* Johnswood, Michigan ..	643	KZIU	*b.* Sagaporack.. ..	983
			KZOA	*b.* Lake Medford ..	953
KUVR	*c.* Jordan, Montana ..	643	KZOE	*b.* Lake Arline ..	948
KUVS	*c.* New York KUVS ..	648	KZOI	*b.* Lake Helen ..	953
KUXG	*c.* Malangas	619	KZOO	*b.* Lake Indian ..	953

		PAGE
KZOU	*b.* Lake Orange	953
KZUA	*b.* Katia	945
KZUE	*b.* Kosciuszko ..	947
KZUI	*b.* Oneco	970
KZUO	*b.* Lone Star	956
KZUU	*b.* Lake Louise ..	953
LP	*c.* Königswusterhausen (Berlin)	598
LZ	*c.* Leipzig	598
LAA	*b.* Eidsvold	765
LAB	*b.* Harald Haarfagre ..	767
LAC	*b.* Norge	779
LAE	*b.* Frithjof	766
LAG	*b.* Ellida	765
LAH	*b.* Farm	766
LAI	*b.* Draug	765
LAL	*b.* Sæl	771
LAM	*b.* Skrei	771
LAN	*b.* Hval	767
LAP	*b.* Lom	769
LAQ	*b.* Jo	768
LAR	*b.* Skarv	771
LAT	*b.* Kjell	768
LAU	*b.* A1	763
LAV	*b.* A2	763
LAW	*b.* A3	763
LAX	*b.* A4	763
LAY	*b.* A5	763
LAZ	*b.* Heimdal	767
LBA	*b.* Æger	763
LBB	*b.* Glommen	766
LBC	*b.* Garm	766
LBD	*b.* Fröya	766
LBE	*b.* Sarpen	771
LBF	*b.* Sild	771
LBG	*b.* Raøn	770
LBH	*b.* Laugen	769
LBI	*b.* Grib..	766
LBZ	*c.* Karljohansvern Radio	615
LCA	*b.* Knut Jarl	768
LCB	*b.* Thomas Haaland ..	773
LCC	*b.* Erle	766
LCD	*b.* Rio Grande LCD ..	770
LCE	*b.* Kongsfoss	768
LCF	*b.* Ramfoss	770
LCG	*b.* Mirjam	769
LCH	*c.* Kristiania Radio ..	615
LCI	*b.* Vela	773
LCJ	*b.* Camilla Gilbert ..	765
LCK	*b.* Gijones	766
LCL	*b.* Belgot	764
LCM	*c.* Stavanger Radio ..	616
LCN	*b.* Elida Clausen ..	765
LCO	*b.* Rygja	771
LCP	*b.* Horda	767
LCR	*b.* Foldenfjord ..	766
LCS	*b.* Ottawa LCS ..	770
LCT	*b.* Besseggen	764
LCU	*b.* Storborg	772
LCV	*b.* Ulla LCV	773
LCW	*b.* Ullstad	773
LCX	*b.* Landaas LCX ..	768
LCY	*b.* Sammanger ..	771
LCZ	*b.* Porsanger LCZ ..	770
LDA	*b.* Bessheim	764
LDB	*b.* Sterling LDB ..	772
LDC	*b.* Havo	767
LDD	*b.* Birk	764

		PAGE
LDE	*b.* Thordis	773
LDF	*c.* Flekkeröy Radio ..	615
LDG	*b.* Noruega	770
LDH	*b.* Mexicano LDH ..	769
LDJ	*b.* Mathilda	769
LDK	*b.* Kong Harald ..	768
LDL	*b.* Haakon VII ..	767
LDM	*b.* Rio de Janeiro LDM	770
LDN	*b.* Rio de la Plata LDN	770
LDO	*b.* Venus LDO ..	773
LDQ	*b.* Irma	767
LDR	*b.* Zeta	773
LDS	*b.* Cometa	765
LDU	*b.* Christian Bors ..	765
LDV	*b.* Orn II	770
LDX	*b.* Ellis LDX	766
LDZ	*b.* Borgestad	765
LEA	*b.* Urter	773
LEB	*b.* Jupiter LEB ..	768
LEC	*b.* Svend Foyn I ..	772
LEE	*b.* Maricopa	769
LEF	*b.* Belridge	764
LEG	*b.* Hessa	767
LEH	*b.* Salerno LEH ..	771
LEI	*c.* Ingöy Radio ..	615
LEJ	*b.* Kinghorn	768
LEK	*b.* Nidaros	769
LEL	*b.* Jason LEL ..	768
LEM	*b.* Salvator	771
LEN	*c.* Sörvaagen Radio ..	615
LEO	*b.* Kamfjord	768
LEP	*b.* Rodskjaer	770
LEQ	*b.* Brazil LEQ ..	765
LER	*b.* Bayard	764
LET	*c.* Tjömey Radio ..	616
LEV	*b.* Mesna	769
LEW	*b.* Simla	771
LEX	*b.* Rinda	770
LEY	*b.* Atle Jarl	764
LFB	*b.* Bergensfjord ..	764
LFC	*b.* Atna	764
LFD	*b.* Rena	770
LFE	*b.* Vinstra	773
LFF	*b.* Tysla	773
LFG	*c.* Spitsbergen ..	627
LFH	*b.* Iris LFH	767
LFI	*b.* Talabot	772
LFJ	*b.* Mira..	769
LFL	*b.* Drammensfjord ..	765
LFM	*b.* Lyngenfjord ..	769
LFO	*b.* Strinda	772
LFQ	*b.* George Washington LFQ	766
LFR	*c.* Röst Radio ..	615
LFS	*b.* Stavangerfjord ..	772
LFT	*b.* Hallfried	767
LFX	*b.* Bonna	765
LFY	*b.* Salvage	771
LFZ	*b.* Arly	764
LGA	*c.* Lukula	570
LGC	*b.* Songvaar	772
LGD	*b.* Hamlet	767
LGE	*b.* Thorvald Halvorsen	773
LGF	*b.* Kalfarli	768
LGG	*b.* Vaarli	773
LGH	*b.* Niels Nielsen ..	769
LGI	*b.* Hanna Nielsen ..	767
LGJ	*b.* Luise Nielsen ..	769
LGK	*c.* Utsire Radio ..	616

		PAGE
LGL	*b.* Capto	765
LGM	*b.* Golaa	766
LGN	*c.* Bergen Radio ..	615
LGO	*b.* Wellington LGO ..	773
LGP	*b.* Sagaland	771
LGQ	*b.* Key West	768
LGR	*b.* Golden Gate ..	766
LGS	*b.* Ramenfjord ..	770
LGT	*b.* Bessa	764
LGU	*b.* Viking LGU ..	773
LGV	*b.* Harde	767
LGW	*b.* Borgland	765
LGX	*b.* Breifond	765
LGY	*b.* Hercules LGY ..	767
LGZ	*b.* Dicto	765
LHA	*b.* Fynd	766
LHB	*b.* Sinaloa	711
LHC	*b.* Baja California ..	764
LHD	*b.* Regulus	779
LHE	*b.* Gaute	766
LHE	*b.* Landaas	768
LHF	*b.* Utsire	773
LHG	*b.* Rövoer	771
LHH	*b.* Grena	766
LHI	*b.* Balto	764
LHJ	*b.* Storviken	772
LHK	*b.* Bjonongen	765
LHL	*b.* Solstreif	771
LHM	*b.* Delfinus	765
LHN	*b.* Nevis	769
LHU	*b.* Björnstjerne Bjornson	765
LHW	*b.* August	764
LHX	*b.* Sydfold	772
LHY	*b.* Solveig Skogland ..	771
LHZ	*b.* Morgana	769
LIA	*c.* Buenos Aires ..	564
LIB	*c.* Trelew	566
LIC	*c.* Gallegos	565
LIG	*c.* Corrientes LIG ..	565
LIH	*c.* Darsena Norte ..	565
LII	*c.* Puerto Militar ..	566
LIJ	*c.* Comodoro Rivadavia	565
LIK	*c.* Ushuaia	566
LIO	*c.* Año Nuevo ..	564
LIS	*c.* Puerto Aguirre ..	566
LIT	*c.* Eldorado	565
LIU	*c.* Formosa, Argentina	565
LIV	*c.* Posadas Misiones ..	565
LIW	*c.* La Paz, Entre Rios	565
LIX	*c.* Zarate, B.A. ..	566
LIY	*c.* Martin Garcia ..	565
LIZ	*c.* Rio Santiago ..	566
LJA	*c.* Faro San Antonio..	565
LJB	*c.* Punta Mogotes ..	566
LJC	*c.* Punta Delgada ..	566
LJD	*c.* S. Julian, Santa Cruz	566
LJE	*c.* Cabo de las Virgenes	564
LJF	*c.* Rio Grande ..	566
LJK	*c.* Practicos Recalada de la Plata Ponton	566
LJL	*c.* Interseccion ..	565
LJM	*c.* Recalada Bahia Blanca Ponton Faro	566
LKA	*b.* Almirante Brown ..	656
LKB	*b.* Belgrano LKB ..	656
LKC	*b.* Buenos Aires LKC	656
LKD	*b.* Catamarca ..	656
LKE	*b.* Chaco	656
LKF	*b.* Córdoba LKF ..	656
LKG	*b.* El Plata LKG ..	656
LKH	*b.* Entre Ríos LKH ..	656
LKI	*b.* Chubut	656
LKJ	*b.* Fragata Sarmiento	656
LKK	*b.* Garibaldi LKK ..	656
LKL	*b.* Gaviota LKL ..	657
LKM	*b.* Guardia Nacional ..	657
LKN	*b.* Independencia ..	657
LKO	*b.* Jujuy	657
LKP	*b.* La Plata LKP ..	657
LKQ	*b.* Libertad	657
LKR	*b.* Los Andes LKR ..	657
LKS	*b.* Ingeniero Luis A. Huergo	657
LKT	*b.* Moreno	657
LKU	*b.* Nueve de Julio ..	657
LKV	*b.* Pampa LKV ..	657
LKW	*b.* Paraná LKW ..	657
LKX	*b.* Aristobulo del Valle	656
LKY	*b.* Patria LKY ..	657
LKZ	*b.* Piedrabuena ..	657
LLA	*b.* Primero de Mayo ..	657
LLB	*b.* Pueyrredón ..	657
LLC	*b.* Rivadavia	657
LLD	*b.* Rosario LLD ..	657
LLE	*b.* S. Martín LLE ..	657
LLF	*b.* Uruguay LLF ..	657
LLH	*b.* Draga 209	656
LLI	*b.* Draga 210	656
LLJ	*b.* Draga 211	656
LLK	*b.* Pampero	657
LLL	*b.* Ingeniero-Iribas ..	657
LLM	*b.* Lisboa	657
LLN	*b.* Berna	656
LLO	*b.* Bruselas	656
LLP	*b.* Ciudad de Buenos Aires	656
LLQ	*b.* Colonia LLQ ..	656
LLR	*b.* Eolo..	656
LLS	*b.* Guarany	657
LLT	*b.* Helios LLT ..	657
LLU	*b.* Labrador LLU ..	657
LLV	*b.* Lambaré	657
LLW	*b.* Londres	657
LLY	*b.* Madrid LLY ..	657
LLZ	*b.* París LLZ	657
LMB	*b.* Tritón LMB ..	657
LMC	*b.* Venus LMC ..	657
LMD	*b.* Washington LMD..	657
LME	*b.* Camarones	656
LMG	*b.* Presidente Mitre ..	657
LMH	*b.* Presidente Quintana	657
LMI	*b.* Río de la Plata LMI	657
LMJ	*b.* Río Uruguay ..	657
LMK	*b.* Bahia Blanca LMK	656
LML	*b.* Patagonia	657
LMM	*b.* S. Martín LMM ..	657
LMN	*b.* Cabo Santa María	656
LMO	*b.* Cabo Corrientes ..	656
LMQ	*b.* Draga 16. C. ..	656
LMR	*b.* Vicente Fidel Lopez	657
LMS	*b.* Argentino LMS ..	656
LMT	*b.* Asturiano	656
LMU	*b.* Formosa LMU ..	656
LMV	*b.* Humaitá	657
LMW	*b.* Draga 212. C. ..	656

		PAGE
LNA	*c.* Direccion General de Arsenales de Guerra	565
LNA	*b.* Ministro Escurra ..	657
LNB	*b.* Alferez Mackinlay	656
LNC	*c.* Cordoba Argentina	565
LNC	*b.* Ona	657
LND	*c.* El Palomar ..	565
LND	*b.* Querandi	657
LNE	*b.* Rio Negro LNE ..	657
LNF	*b.* Azopardo	656
LNG	*c.* Colegio Militar ..	564
LNG	*b.* Corrientes LNG ..	656
LNH	*b.* Misiones	657
LNK	*b.* Draga 14. C. ..	656
LNL	*c.* Liniers	565
LNL	*b.* Draga 13	656
LNM	*c.* Mendoza	565
LNR	*c.* Comando 1ra Division Ejercito ..	564
LNS	*c.* Comando 2da Division Ejercita ..	565
LNT	*c.* Tucuman	566
LPA	*c.* Rosario de Santa Fé	566
LPB	*c.* Parana	565
LPC	*c.* Corrientes LPC ..	565
LPD	*c.* Puerto Bermejo ..	566
LSA	*b.* W. I. Radcliffe ..	894
LSC	*b.* Mineric	859
LSE	*b.* Seamew	878
LSF	*b.* Clan Chisholm ..	820
LSG	*b.* Clan Macfadyen ..	821
LSH	*b.* Clan Menzies ..	823
LSI	*b.* Juliston	846
LSJ	*b.* Graphic	839
LSK	*b.* Comic	825
LSL	*b.* Logic	851
LSM	*b.* Patriotic	867
LSN	*b.* Inishboffin	845
LSO	*b.* Treloske	887
LSP	*b.* Carron	816
LSQ	*b.* Bampton	808
LSR	*b.* Clan Murray ..	823
LST	*b.* Millais	859
LSU	*b.* Bloomfield	812
LSV	*b.* Grelfryda	839
LSW	*b.* Kings City ..	848
LSX	*b.* Dorie	829
LSY	*b.* Buranda	814
LSZ	*b.* Breynton	813
LTB	*b.* Jabiru	845
LTC	*b.* Benlomond ..	811
LTD	*b.* Cosmos	826
LTF	*b.* Hillhouse	842
LTG	*b.* Speaker	881
LTI	*b.* Clearpool	824
LTJ	*b.* Millpool	859
LTM	*b.* Albuera	803
LTO	*b.* Macoris	853
LTP	*b.* Sagua	877
LTR	*b.* Manx Isles ..	856
LTS	*b.* Clan Macwilliam ..	823
LTU	*b.* Neva LTU ..	862
LTV	*b.* Mahana	853
LTW	*b.* Mahia	853
LTX	*b.* Saxoleine	878
LTZ	*b.* Nagara	861
LUA	*b.* Ariadne Alexandra	805
LUB	*b.* Hannington Court	841
LUC	*b.* City of Winchester	820
LUD	*b.* Wedgwood ..	893
LUE	*b.* Capsa	816
LUG	*b.* Cymric Vale ..	827
LUI	*b.* Berriedale	811
LUJ	*b.* Tremayne	887
LUK	*b.* Wimbledon.. ..	893
LUL	*b.* Ethelwolf	833
LUM	*b.* Ethelaric	833
LUN	*b.* War Bahadur ..	891
LUO	*b.* Alatrium	803
LUP	*b.* Labicum	849
LUQ	*b.* Maihar	853
LUR	*b.* Manaar	854
LUS	*b.* Courtown	827
LUT	*b.* Afghanistan ..	802
LUT	*b.* Aberdeen	801
LUV	*b.* Laplace LUV ..	850
LUW	*b.* Bayhowel ..	809
LUY	*b.* Astronomer ..	807
LUZ	*b.* Baron Fairlie ..	809
LVA	*c.* Guatemala City ..	601
LWA	*b.* Jessie	768
LWB	*b.* Knut Hamsun ..	768
LWF	*b.* Bombay	765
LWI	*b.* Homledal	767
LWK	*b.* Graziella	766
LWL	*b.* Hovland	767
LWM	*b.* Ingeborg Bakkevig	767
LWO	*b.* Alaska LWO ..	763
LWP	*c.* Björnöen Radio ..	615
LWQ	*b.* Orwell LWQ ..	770
LWR	*b.* Sirrah LWR ..	771
LWT	*b.* Times	773
LWU	*b.* Alstad	764
LWV	*b.* Nils	769
LWW	*b.* Tento	772
LWX	*b.* Atlantis	764
LWX	*b.* Boliviana	765
LWY	*b.* Truth	773
LWZ	*b.* Bravore	765
LZF	*c.* Varna	577
MA	*c.* Magdeburg	598
MG	*c.* Margosatubig ..	619
MAA	*b.* Carmania	816
MAB	*b.* Kandahar	847
MAC	*b.* S. Gregorio ..	883
MAD	*b.* Musician	861
MAG	*b.* City of Chester ..	819
MAJ	*b.* Calabria MAJ ..	815
MAM	*b.* Matoppo	857
MAN	*b.* S. Dunstano ..	883
MAO	*b.* S. Tirso	884
MAQ	*b.* Bolton Castle ..	812
MAR	*b.* Italia MAR ..	845
MAU	*b.* Cardiganshire ..	816
MAV	*b.* Swazi	883
MAX	*c.* Broomfield, Essex ..	631
MAZ	*b.* Aronda	806
MBB	*b.* Asturias	807
MBC	*b.* Baltic MBC ..	808
MBE	*b.* Lumen	852
MBF	*b.* Saturnia	877
MBG	*b.* Araguaya	805
MBM	*b.* Mediterranean Star	857
MBO	*b.* Avon	807
MBP	*b.* Lancastrian ..	849
MBR	*b.* S. Ricardo ..	884
MBT	*b.* Rimutaka	874
MBV	*b.* Chignecto	818

		PAGE			PAGE
MBW	*b.* Maryland	857	MGA	*b.* Mauretania ..	857
MBX	*b.* Elveric	832	MGD	*b.* Baron Jedburgh ..	809
MCD	*b.* Viking MCD ..	890	MGF	*b.* Orcana	865
MCE	*b.* Khyber	848	MGG	*b.* S. Albans	883
MCF	*b.* Canada MCF ..	815	MGI	*b.* Orbita	865
MCG	*b.* Cambria MCG ..	815	MGJ	*b.* Oruba MGJ ..	866
MCH	*b.* Bandra	808	MGK	*b.* Demosthenes ..	828
MCJ	*b.* Telconia	885	MGM	*b.* Themistocles MGM	886
MCL	*b.* Colonia MCL ..	825	MGN	*b.* Virginian	891
MCM	*b.* Princess Victoria MCM	872	MGO	*b.* Orca	865
			MGP	*b.* Orduna	865
MCN	*b.* Corsican	826	MGR	*c.* Mongalla	628
MCP	*b.* Ceramic	817	MGR	*b.* Rassay	873
MCQ	*b.* Munster	861	MGX	*b.* Kirnwood	848
MCW	*b.* Ulster	889	MGZ	*b.* Khiva	848
MCX	*b.* River Trent ..	875	MHB	*b.* Indian	845
MCY	*b.* City of Madras ..	819	MHC	*b.* Adriatic	802
MDA	*b.* Highland Enterprise	842	MHG	*b.* Carpentaria ..	816
MDC	*b.* Cedric	817	MHH	*c.* Poole (The Haven)	634
MDE	*b.* Denis	828	MHI	*b.* Olympia	865
MDF	*b.* Dominion	829	MHJ	*b.* Scindia	878
MDG	*b.* Francis	835	MHK	*b.* Sapphire	877
MDI	*b.* Pancras	867	MHO	*b.* Cordobes (El) ..	831
MDJ	*b.* Stephen	882	MHQ	*b.* Massilia	857
MDK	*b.* Anselm	804	MHR	*b.* Oxonian	866
MDM	*b.* Hildebrand ..	842	MHT	*b.* Historian	843
MDN	*b.* Sardinian	877	MHV	*b.* Craftsman MHV ..	827
MDT	*b.* Caledonian ..	815	MHX	*b.* Penrhys	868
MDU	*b.* City of Algiers ..	818	MHY	*b.* Paparoa	867
MDW	*b.* Worsley Hall ..	894	MHZ	*b.* S Valerio	884
MDX	*b.* Lena	850	MID	*b.* Orlando	865
MDZ	*b.* Arundel	806	MIE	*b.* Corcovado MIE ..	825
MEB	*b.* Ninian	863	MIF	*b.* Inca MIF	844
MED	*b.* Cassandra	817	MIG	*b.* Memnon	858
MEE	*b.* Electra	831	MII	*b.* Potosi	871
MEF	*b.* John Pender ..	846	MIJ	*b.* Sorata	881
MEG	*b.* Norseman	863	MIL	*b.* Palermo	866
MEH	*b.* Magnet	853	MIP	*b.* Intaba	845
MEI	*b.* Iroquois	845	MIT	*b.* Genesee MIT ..	836
MEJ	*b.* Recorder	873	MIU	*b.* Andorinha ..	804
MEK	*b.* Highland Heather	842	MIV	*b.* Ottawa	866
MEL	*b.* Bohemian	812	MIW	*b.* Somali MIW ..	881
MEM	*b.* Patrol	867	MIX	*b.* Monadnock MIX	859
MEN	*b.* Navahoe	861	MIY	*b.* Suwanee	883
MEO	*b.* Nortonian	864	MJC	*b.* Suevic	882
MEP	*b.* Highland Laird ..	842	MJF	*b.* Orcoma	863
MER	*b.* Highland Watch ..	842	MJG	*b.* Orita	865
MES	*b.* Raeburn	873	MJH	*b.* Haverford	841
MET	*b.* Raphael	873	MJJ	*b.* Oriana	865
MEU	*b.* Rembrandt MEU ..	874	MJK	*b.* Ortega	866
MEV	*b.* Romney MEV ..	875	MJL	*b.* Antillian	805
MEW	*b.* Nellore	862	MJM	*b.* Merion	858
MEY	*b.* Rossetti	876	MJN	*b.* Scotian	878
MEZ	*b.* Glenetive	837	MJP	*b.* S. Jeronimo ..	883
MFB	*b.* Sentinel II ..	870	MJQ	*b.* Westmeath ..	893
MFJ	*b.* Cormorant MFJ ..	826	MJS	*b.* Baron Napier ..	809
MFK	*b.* Sherard Osborn ..	879	MJT	*b.* Llanstephan Castle	851
MFL	*b.* Winifredian ..	894	MJV	*b.* S. Eduardo ..	883
MFM	*b.* Aidan	802	MJW	*b.* Vauban	890
MFN	*b.* Pretorian	871	MJX	*b.* Hartington ..	841
MFQ	*b.* Borda	812	MJZ	*b.* Vestris	890
MFR	*b.* Mayaro	857	MKA	*b.* Ruahine	877
MFS	*b.* Banca	808	MKB	*b.* Ruapehu	877
MFT	*c.* Clifden Rad ..	631	MKC	*b.* Olympic	865
MFU	*b.* Aeneas	802	MKD	*b.* Palma MKD ..	866
MFV	*b.* Ascanius	806	MKG	*b.* Delta MKG ..	828
MFW	*b.* Anchises	804	MKK	*b.* Medic	857
MFX	*b.* Marshal French ..	857	MKL	*b.* Asian	806
MFY	*b.* Kelvinbrae ..	847	MKO	*b.* Chinkoa	818

		PAGE
MKR	*b.* Beltana	810
MKV	*b.* Remuera	879
MKW	*b.* Great City	839
MKX	*b.* Malakand	854
MKZ	*b.* Ascot	806
MLA	*b.* Minnie de Larrinaga	859
MLC	*b.* Celtic	817
MLD	*b.* Ranger MLD	873
MLG	*b.* Missouri MLG	859
MLL	*b.* Barranca MLL	809
MLR	*c.* Malakal	628
MLS	*b.* Manzanares	856
MLT	*b.* Matina	857
MLV	*b.* Nicoya	863
MLX	*b.* Sheaf Dart	879
MLY	*b.* Pacuare	866
MMB	*b.* Mackay-Bennett	853
MMC	*b.* Reresby	874
MMD	*b.* Malwa	854
MME	*b.* Mantua	855
MMF	*b.* Morea	860
MMG	*b.* Egypt	831
MML	*b.* Macedonia MML	853
MMR	*b.* Marmora	856
MMU	*b.* China	818
MMX	*b.* Matheran	857
MNA	*b.* Pannonia	867
MNB	*b.* Soudan	881
MNC	*b.* Scandinavian	878
MND	*b.* S. Lorenzo	884
MNE	*b.* Menominee MNE	858
MNG	*b.* Digby	829
MNH	*b.* Dongola	829
MNI	*b.* Iris MNI	845
MNJ	*b.* Plassy	869
MNL	*b.* Kanawha MNL	847
MNT	*b.* Cambrian	815
MNU	*b.* Caledonia	815
MNX	*b.* Raithwaite	873
MNY	*b.* Himalaya	842
MNZ	*b.* City of Agra	818
MOB	*b.* Hardanger	841
MOC	*b.* Clan Macintyre	822
MOE	*b.* Benefactor	811
MOF	*b.* Orsova	865
MOI	*b.* Columbia MOI	825
MOJ	*b.* Orvieto	866
MOL	*b.* Sachem	877
MOM	*b.* Norman	863
MOO	*b.* Assaye	806
MOQ	*b.* Grianaig	849
MOR	*b.* Takada	885
MOS	*b.* Waimate	891
MOU	*b.* Devanha	829
MOV	*b.* Brighton MOV	813
MOW	*b.* Carisbrook Castle	816
MOX	*b.* Astraea	807
MOY	*b.* Osterley	866
MOZ	*b.* Orontes	865
MPB	*b.* Empress of Britain	832
MPC	*b.* Canopic	815
MPD	*c.* Poldhu Radio	634
MPE	*b.* King Orry	848
MPG	*b.* Tamar	885
MPM	*b.* Changuinola	817
MPN	*b.* Motagua	860
MPO	*b.* Cassis	817
MPP	*b.* Melania	858
MPQ	*b.* Dunvegan Castle	830
MPR	*b.* Barpeta	809
MPS	*b.* S. Zeferino	884
MPV	*b.* Pathan	867
MPW	*b.* Balmoral Castle	808
MPX	*b.* Masirah	857
MPZ	*b.* Guildford Castle	840
MQC	*b.* Persic	868
MQD	*b.* Caraquet	816
MQE	*b.* Edinburgh Castle	831
MQF	*b.* Kenilworth Castle	847
MQG	*b.* Armadale Castle	806
MQH	*b.* Walmer Castle	891
MQI	*b.* Saxon	878
MQJ	*b.* Briton	814
MQK	*b.* Kildonan Castle	848
MQL	*b.* Kinfauns Castle	848
MQN	*b.* Durham Castle	831
MQO	*b.* Dunluce Castle	830
MQP	*b.* Garth Castle	836
MQQ	*b.* Grantully Castle	839
MQS	*b.* Glengorm Castle	837
MQU	*b.* Gaika	835
MQV	*b.* Gascon	836
MQW	*b.* Goorkha	838
MQX	*b.* Wallace	891
MQY	*b.* S. Patricio	884
MQZ	*b.* Gloucester Castle	838
MRA	*b.* Caronia	816
MRB	*b.* Tudorstar	888
MRC	*b.* Cretic	827
MRF	*b.* Hororata	843
MRG	*b.* Opawa	865
MRH	*b.* Elysia	832
MRI	*b.* Whakatane	893
MRJ	*b.* Aylesbury	807
MRL	*b.* Dieppe	829
MRM	*b.* Orari	865
MRN	*b.* Grampian	839
MRO	*b.* Romanstar	875
MRQ	*b.* Andes MRQ	804
MRS	*b.* Kaikoura	846
MRV	*b.* Waiwera	891
MRW	*b.* Kansas MRW	847
MRZ	*b.* S. Melito	884
MSA	*b.* Saxonia	878
MSB	*b.* Karamea	847
MSC	*b.* Ibex	844
MSD	*b.* Reindeer MSD	874
MSE	*b.* Euripides	833
MSH	*b.* Madras	853
MSI	*b.* Kaisar-i-Hind	846
MSK	*c.* Moscow	621
MSL	*b.* Trafford Hall	887
MSM	*b.* Nemesis	862
MSO	*b.* Poona	870
MSP	*b.* Maple MSP	856
MSQ	*b.* Knight of the Garter	848
MSR	*b.* Varela	889
MSS	*b.* Baron Berwick	809
MST	*b.* Bamora	808
MSU	*b.* Aquitania	805
MSW	*b.* City of Exeter	819
MSX	*b.* Flandrier	834
MSZ	*b.* Caesarea	815
MTB	*b.* Wyneric	895
MTC	*b.* Teutonic	885
MTE	*b.* Risaldar	875
MTF	*b.* Karmala	847
MTH	*b.* Walton Hall	891

		PAGE
MTJ	*b.* Ebro	831
MTK	*b.* Essequibo	833
MTL	*b.* Collegian	825
MTM	*b.* City of Madrid	819
MTN	*b.* Tunisian	888
MTO	*b.* Rose	876
MTP	*b.* City of Rangoon	820
MTQ	*b.* Dacre Castle	827
MTV	*b.* North Western Miller	863
MTX	*b.* Zealand	895
MTY	*b.* South Western Miller	881
MUA	*b.* Herschel	842
MUB	*b.* Holbein	843
MUE	*b.* Gleniffer	837
MUG	*b.* City of Hankow	819
MUH	*b.* S. Nazario	884
MUI	*b.* Lucerna	852
MUK	*b.* Sir Harvey Adamson	880
MUL	*b.* Frank Parish	835
MUM	*b.* Borderland	812
MUN	*b.* Sicilian	879
MUO	*b.* Chakdara	817
MUP	*b.* Morvada	860
MUQ	*b.* S. Florentino	883
MUS	*b.* Carmarthenshire	816
MUT	*b.* Pembrokeshire	867
MUU	*c.* Carnarvon Radio	631
MUV	*c.* Towyn	635
MUX	*b.* S. Fernando	883
MUZ	*b.* Zealandic	895
MVB	*b.* Peel Castle	867
MVD	*b.* Ormara	865
MVI	*b.* Hubert	843
MVN	*b.* Victorian	890
MVO	*b.* Gallic	836
MVP	*b.* Abinsi	802
MVQ	*b.* Viking MVQ	890
MVS	*b.* Sussex	883
MVV	*b.* Explorer MVV	833
MVY	*b.* Inventor	845
MVZ	*b.* Politician	869
MWB	*b.* Panama MWB	867
MWC	*b.* Runic	877
MWE	*b.* Arawa	805
MWF	*b.* Tainui	885
MWG	*b.* Mexico MWG	859
MWI	*b.* Ionic	845
MWJ	*b.* Mersey	859
MWK	*b.* Quillota	873
MWM	*b.* Guatemala	840
MWN	*b.* Athenic MWN	807
MWP	*b.* Tactician	884
MWQ	*b.* Chakla	817
MWR	*b.* Dorington Court	829
MWT	*b.* Corinthic	826
MWW	*b.* Baron Ardrossan	809
MWY	*b.* Circassia	818
MWZ	*b.* Castalia MWZ	817
MXD	*b.* Vindelia	890
MXF	*b.* Oakfield	864
MXG	*b.* Kenmare MXG	848
MXH	*b.* Sheaf Spear	879
MXI	*b.* Ingleby	845
MXJ	*b.* Glendhu	837
MXM	*b.* Cordelia	826
MXN	*b.* Portinglis	871
MXR	*b.* Delphinula	828
MXS	*b.* Heathmore	841
MXX	*b.* Portreath	871
MXZ	*b.* Tiverton	886
MYA	*b.* Herefordshire	842
MYB	*b.* Derbyshire	828
MYD	*b.* Elswick Hall	832
MYE	*b.* Oxfordshire	866
MYF	*b.* Chyebassa	818
MYG	*b.* Gloucestershire	838
MYH	*b.* Clearway	824
MYJ	*b.* Elwick	832
MYL	*b.* Leicestershire	850
MYN	*b.* Tahiti	884
MYO	*b.* Warwickshire	892
MYP	*b.* Stuartstar	882
MYQ	*b.* Strombus	882
MYS	*b.* S. Silvestre	884
MYT	*b.* Corbrae	825
MYX	*b.* Laertes	728
MZB	*b.* Cardium	816
MZC	*b.* Megantic	857
MZD	*b.* Telima	885
MZE	*b.* Akabo	802
MZH	*b.* Mitra	859
MZI	*b.* Elmina	832
MZN	*b.* Natica	861
MZO	*b.* Patella	867
MZP	*b.* Ranella	873
MZQ	*b.* Clan Matheson	823
MZR	*b.* Carnarvonshire	816
MZV	*b.* Vita	891
MZW	*b.* Nirvana	863
MZX	*c.* Chelmsford	631
MZY	*b.* Chakdina	817
MZZ	*b.* Pasha	867
NAA	*c.* Washington, NAA	653
NAB	*c.* Portland, Maine	650
NAB	*c.* Cape Elizabeth, Maine	638
NAC	*c.* Portsmouth, New Hampshire	650
NAD	*c.* Gloucester, Massachusetts	643
NAD	*c.* Deer Island	639
NAD	*c.* Fourth Cliff	643
NAE	*c.* Cape Cod	638
NAF	*c.* Newport, Rhode Island	648
NAF	*c.* Price's Neck, Rhode Island	650
NAH	*c.* Fire Island	640
NAH	*c.* Montauk Point	647
NAH	*c.* Brooklyn	637
NAH	*c.* Sea Gate	651
NAH	*c.* Sandy Hook	651
NAH	*c.* Mantoloking	647
NAI	*c.* Philadelphia	649
NAJ	*c.* Great Lakes	643
NAL	*c.* Washington NAL	653
NAM	*c.* Norfolk, Virginia	648
NAM	*c.* Hampton Roads	643
NAN	*c.* Cape Lookout	638
NAN	*c.* Morehead City, North Carolina	648
NAO	*c.* Charleston, South Carolina	639
NAP	*c.* S. Augustine, Florida	651
NAQ	*c.* Jupiter NAQ	643

		PAGE
NAR	*c.* Key West, Florida	644
NAS	*c.* Pensacola, Florida ..	649
NAT	*c.* New Orleans ..	648
NAU	*c.* S. Juan, Porto Rico	620
NAV	*c.* Port Royal, South Carolina	650
NAW	*c.* Guantanamo Bay ..	585
NAX	*c.* Colon	616
NAY	*c.* Point Isabel ..	649
NAZ	*c.* Managua	615
NBA	*c.* Balboa	616
NBA	*c.* Darien, Panama ..	616
NBB	*c.* S. Thomas	654
NBD	*c.* Bar Harbor ..	636
NBG	*c.* Indianhead, Maryland	643
NBI	*b.* Alabama NBI . ..	897
NBJ	*b.* Albany	898
NBL	*b.* Alert NBL	898
NBM	*c.* Amagansett ..	636
NBP	*b.* Ammon NBP ..	899
NBR	*b.* Annapolis	899
NBS	*c.* Surfside Nantucket	651
NBS	*c.* Siasconsett ..	651
NBT	*c.* Rockaway Beach, New York ..	650
NBU	*b.* Arethusa	901
NBV	*b.* Arkansas	901
NBW	*b.* Arizona NBW ..	901
NBX	*c.* Burrwood NBX ..	637
NBX	*c.* Pass A. Loutre ..	649
NBZ	*c.* Baltimore, Maryland	636
NCA	*b.* Nevada	967
NCB	*b.* Oklahoma	969
NCC	*b.* New York NCC ..	967
NCD	*b.* Texas NCD ..	1004
NCE	*b.* Pennsylvania NCE	973
NCF	*b.* Bailey	902
NCH	*b.* Baltimore	903
NCL	*b.* Beale	904
NCN	*b.* Birmingham ..	905
NCO	*b.* Arcturus	901
NCR	*b.* Canandaigua ..	909
NCS	*b.* Canonicus	909
NCU	*b.* Buffalo	908
NCV	*b.* Burrows	908
NCX	*b.* Dreadnaught ..	923
NCY	*b.* Caesar	909
NCZ	*c.* Hog Island	643
NCZ	*c.* Virginia Beach ..	652
NCZ	*c.* Poyner's Hill, North Cal.	650
NDB	*b.* Celtic NDB ..	911
NDD	*c.* Savville	651
NDF	*b.* California NDF ..	909
NDG	*b.* Chester	913
NDH	*b.* Cheyenne NDH ..	913
NDI	*b.* Chicago NDI ..	913
NDJ	*b.* Gorgona	935
NDK	*c.* Cape Fear	638
NDL	*c.* Ecorse, Michigan ..	640
NDM	*b.* Cleveland	915
NDN	*b.* Pueblo	976
NDO	*b.* Comfort	917
NDQ	*b.* Connecticut ..	917
NDR	*b.* Lydonia	957
NDU	*b.* Culgoa	920
NDV	*b.* S.P. 493	988
NDW	*c.* Cape Hatteras ..	638
NDX	*b.* Hubbard	941
NEC	*b.* Geo. Washington ..	934
NEK	*b.* Delaware NEK ..	922
NEL	*c.* Lakehurst, New York	644
NEM	*b.* Denver	922
NEN	*b.* Des Moines ..	922
NEO	*b.* Stockton NEO ..	990
NEP	*b.* Dixie	923
NEQ	*b.* Dolphin NEQ ..	923
NET	*b.* Drayton	923
NEV	*c.* Savannah	651
NEV	*c.* Tybee Island ..	652
NEX	*b.* Sea Rover	985
NFA	*b.* Brooklyn	907
NFD	*b.* Elcano	928
NFE	*b.* Charleston ..	912
NFF	*c.* New Brunswick, New Jersey	648
NFH	*c.* Smith Island, Wash.	651
NFI	*c.* Jacksonville, Florida	643
NFM	*b.* Fanning	929
NFN	*c.* Cattle Point, Wash.	638
NFR	*b.* Florida NFR ..	931
NFT	*c.* New Dungeness ..	648
NFT	*c.* Port Angeles ..	649
NFV	*b.* Fish Hawk NFV ..	930
NFX	*b.* Housatonic ..	940
NFZ	*b.* Rainbow NFZ ..	978
NGA	*b.* Columbia NGA ..	916
NGB	*b.* Minneapolis ..	962
NGC	*b.* Boston NGC ..	906
NGD	*b.* Galveston	933
NGE	*c.* Miami, Florida ..	647
NGF	*b.* Georgia NGF ..	934
NGG	*b.* Olympia NGG ..	970
NGH	*b.* Glacier	934
NGI	*b.* Chattanooga NGI ..	913
NGJ	*b.* Goldsborough ..	935
NGK	*b.* Marble Head ..	959
NGL	*c.* S. Petersburg, Fa ..	652
NGN	*b.* Pensacola NGN ..	973
NGP	*b.* Beaufort	904
NGQ	*b.* Quincy	977
NGR	*b.* Bridgeport	907
NGS	*b.* Savannah	984
NGT	*c.* Mobile, Alabama ..	647
NGU	*b.* Hannibal	937
NGV	*b.* Hartford	938
NGW	*b.* Wolverine	1015
NGX	*b.* Hector NGX ..	938
NGY	*b.* Helena	938
NGZ	*b.* Houston NGZ ..	940
NHA	*b.* Henley	939
NHD	*b.* Monadnock NHD	963
NHH	*b.* Ozark	971
NHI	*b.* Hancock	937
NHN	*b.* Idaho NHN ..	941
NHO	*b.* Illinois NHO ..	941
NHQ	*b.* Indiana NHQ ..	941
NHT	*b.* Iowa	942
NHU	*b.* Roanoke NHU ..	979
NHV	*b.* Iroquois NHV ..	942
NHW	*b.* Kittery	947
NHY	*b.* Bath	903
NHZ	*b.* Newport News ..	967
NIB	*b.* Jarvis	943
NIE	*b.* Jouett	944
NIF	*b.* Chauncey	913

		PAGE
NIH	*b.* Aylwin	902
NII	*b.* Balch	903
NIJ	*b.* Benkam	905
NIK	*b.* Cassin	911
NIL	*b.* Cumings	920
NIM	*b.* Cushing NIM	920
NIN	*b.* Downes	923
NIO	*b.* Kansas NIO	945
NIP	*b.* Kearsarge	945
NIQ	*b.* Kentucky NIQ	946
NIR	*b.* Duncan	923
NIS	*b.* Ericsson	929
NIT	*b.* McDougal	960
NIU	*b.* Nicholson	967
NIV	*b.* O'Brien NIV	969
NIX	*b.* Parker	972
NIZ	*b.* Lebanon NIZ	955
NJA	*b.* Winslow	1015
NJB	*b.* Louisiana NJB	957
NJC	*b.* Decatur NJC	921
NJD	*b.* Allen	899
NJE	*b.* Conyngham	917
NJF	*b.* Davis	921
NJG	*c.* San Domingo City	624
NJJ	*b.* Wenonah	1009
NJL	*b.* Maine NJL	957
NJR	*b.* Mars	959
NJS	*b.* Frederick	932
NJT	*b.* Massachusetts	959
NJU	*b.* Mayrant	960
NJV	*b.* Mayflower NJV	960
NJW	*b.* McCall	960
NJX	*b.* Willoughby	1015
NJY	*c.* Port Arthur, Texas	650
NJZ	*b.* Michigan NJZ	961
NKA	*b.* Melville NKA	961
NKB	*c.* Galveston	643
NKC	*c.* Navassa Island	611
NKD	*b.* Minnesota NKD	962
NKE	*b.* Mississippi NKE	962
NKF	*b.* Missouri NKF	962
NKK	*b.* Mercy	961
NKN	*b.* Monterey NKN	963
NKQ	*b.* Wilkes	1014
NKR	*b.* Rowan	980
NKS	*b.* Sampson	983
NKT	*b.* Schley	984
NKU	*b.* Shaw	986
NKV	*b.* Tucker	1005
NKW	*b.* Wadsworth	1007
NKZ	*b.* Navajo	966
NLA	*c.* Light Vessel No. 85	646
NLC	*c.* Light Vessel No. 94	647
NLD	*c.* Bird Island, Cal.	637
NLF	*b.* Kukui	847
NLG	*c.* Point Reyes	648
NLH	*c.* Point Montara	649
NLI	*c.* Grand Island, Louisiana	643
NLL	*b.* Columbine NLL	917
NLM	*b.* Cypress	921
NLN	*b.* Ellington	928
NLP	*c.* Light Vessel No. 81	646
NLR	*b.* Roosevelt	980
NLT	*b.* Orchid	970
NLU	*b.* Manzanita	959
NLV	*b.* Sequoia	985
NLW	*b.* Cedar	911
NLY	*b.* Topeka	1005
NMA	*b.* Nebraska NMA	966
NMB	*c.* Maniti	585
NMC	*b.* Vestal	1007
NMD	*c.* Point Hueneme	649
NME	*b.* New Hampshire NME	967
NMF	*b.* New Jersey	967
NMG	*b.* New Orleans	967
NMH	*b.* Newport NMH	967
NMK	*b.* Aroostook	901
NML	*b.* Shawmut	986
NMM	*c.* Marion NMM	647
NMO	*b.* North Dakota	967
NMS	*b.* Neptune NMS	966
NMW	*b.* Ohio	969
NMZ	*b.* Oregon NMZ	970
NNA	*b.* Brutus	908
NNB	*b.* Jason NNB	943
NND	*b.* Kanawha NND	945
NNE	*b.* Maumee	960
NNF	*b.* Nereus	966
NNG	*b.* Proteus	976
NNH	*b.* Leonidas	955
NNI	*c.* St. Croix	654
NNK	*b.* Nanshan	965
NNL	*c.* Coco Solo	616
NNM	*b.* Saturn	984
NNO	*b.* Carola IV	910
NNP	*b.* Kivasind	947
NNQ	*b.* Corona NNQ	918
NNT	*c.* Cape Mala	616
NNW	*c.* La Palma	616
NNZ	*c.* Buffalo, N.Y.	637
NOA	*b.* Oeceola	969
NOB	*b.* Abarenda	896
NOD	*b.* Cuyama	921
NOE	*b.* Penobscot	973
NOG	*b.* Paducah	971
NOH	*b.* Henderson	939
NOI	*b.* Bridge	907
NOJ	*b.* Panther	972
NOK	*b.* Patterson NOK	973
NOL	*b.* Patapsco	973
NOM	*b.* Patuxent	973
NON	*b.* Paulding	973
NOO	*b.* Porter	975
NOQ	*b.* Yale	1016
NOT	*b.* Pittsburgh	975
NOW	*b.* Peoria	973
NOX	*b.* Perkins	974
NPA	*c.* Cordova, Alaska	559
NPB	*c.* Sitka, Alaska	562
NPD	*c.* Slip Point, Washington	651
NPD	*c.* Tatoosh	652
NPE	*c.* Fort Stevens NPE	642
NPE	*c.* North Head	649
NPE	*c.* Ocean Park, Washington	649
NPF	*c.* Marshfield, Oregon	647
NPF	*c.* Empire, Oregon	640
NPG	*c.* Mare Island	647
NPG	*c.* San Francisco NPG	652
NPG	*c.* Yerba Buena, California	653
NPH	*c.* Vladivostok	623
NPI	*c* Farrallons, California	640
NPI	*c.* Farallon Island	640
NPK	*c.* Point Arguello	649

		PAGE
NPL	*c.* Imperial Beach, California	643
NPL	*c.* Point Loma, California	649
NPL	*c.* S. Diego, California	651
NPM	*c.* Pearl Harbor	601
NPM	*c.* Heeia Point	601
NPN	*c.* Guam	609
NPO	*c.* Cavite	618
NPP	*c.* Peking NPP	583
NPQ	*c.* S. Paul, Alaska	562
NPR	*c.* Dutch Harbor	559
NPS	*c.* Kodiak	560
NPT	*c.* Olongapo	619
NPU	*c.* Tutuila	623
NPV	*c.* Seward, Alaska	562
NPW	*c.* Eureka, California	640
NPX	*c.* Inglewood, California	643
NPX	*c.* Point Fermin	649
NPX	*c.* S. Pedro Calif.	652
NPY	*c.* S. George, Alaska	562
NPZ	*c.* Puget Sound, Washington	650
NPZ	*c.* Keyport, Washington	643
NQA	*b.* Isis NQA	942
NQB	*c.* Ashtabula	636
NQF	*b.* Pompey	975
NQH	*b.* Concord NQH	917
NQK	*b.* Potomac NQK	975
NQL	*b.* Machias	957
NQM	*b.* Prairie	975
NQQ	*b.* Monocacy	963
NQR	*b.* Prometheus NQR	976
NQS	*b.* Palos	972
NQT	*b.* Pampanga	972
NQU	*b.* Surveyor	1000
NQV	*b.* Sacramento NQV	982
NQX	*b.* Yorktown	1017
NQZ	*b.* Quiros	977
NRA	*b.* Algonquin	998
NRB	*b.* Bear	994
NRC	*b.* Morrill	963
NRD	*b.* Androscoggin	899
NRE	*b.* Seneca NRE	985
NRE	*b.* Tallapoosa	1003
NRF	*b.* Snoohomish	987
NRG	*b.* Gresham	935
NRH	*c.* Cleveland, Ohio	639
NRI	*b.* Itasca	942
NRJ	*b.* Ossipee	971
NRK	*c.* Puerto Obaldia	617
NRM	*b.* Mohawk NRM	962
NRN	*b.* Manning	958
NRO	*b.* Onondaga	970
NRQ	*c.* Detroit, Michigan	639
NRR	*b.* Pamlico	972
NRS	*b.* Seminole NRS	985
NRT	*b.* Little	956
NRU	*b.* Acushnet	896
NRW	*b.* Comanche NRW	917
NRX	*b.* Unalga	1006
NRY	*b.* Yamacraw	1016
NSC	*c.* Port-au-Prince	601
NSD	*c.* Cape May	638
NSD	*c.* Cape Henlopen	638
NSD	*c.* Bethany Beach, Delaware	637
NSE	*b.* Tennessee	1003

		PAGE
NSF	*c.* Anacostia NSF	636
NSH	*b.* Manley	957
NSI	*b.* Caldwell	909
NSK	*b.* Yankton	1016
NSL	*c.* Lightvessel No. 68	645
NSM	*c.* Alpena	636
NSM	*c.* Thunder Bay Island, Michigan	652
NSN	*b.* Conner	917
NSR	*c.* Frankfort, Michigan	643
NSR	*c.* Nasser	628
NSS	*c.* Annapolis, Maryland NSS	636
NST	*b.* Solace	987
NSU	*b.* Vixen	1007
NSW	*b.* South Carolina	988
NSZ	*b.* Cumberland NSZ	921
NTB	*b.* Sterrett	990
NTE	*b.* Raleigh NTE	978
NTG	*b.* Sonoma NTG	988
NTK	*b.* Supply	1000
NTL	*b.* Sylph	1001
NTM	*c.* Ludington, Michigan	647
NTN	*b.* Fairfax	929
NTO	*b.* Mohave	962
NTP	*b.* Salem	983
NTQ	*b.* S. Francisco NTQ	1001
NTR	*b.* Rochester NTR	980
NTR	*b.* Saratoga	984
NTT	*b.* Scorpion	985
NTW	*c.* Appledore Island, Maine	636
NTX	*b.* Rhode Island NTX	979
NTY	*c.* Manitowoc	647
NTZ	*b.* Roe	980
NUA	*b.* Tacoma NUA	1003
NUB	*c.* Manistique	647
NUC	*b.* Tallahassee	1003
NUD	*c.* Mackinac Island	647
NUG	*c.* Calumet	637
NUG	*c.* Eagle Harbour, Michigan	640
NUI	*b.* Terry	1003
NUK	*c.* Milwaukee, Wisconsin	647
NUN	*b.* Tonopah	1005
NUQ	*b.* Trippe	1005
NUR	*c.* Chicago NUR	639
NUU	*b.* Samoset	728
NUV	*b.* Sebago	985
NUX	*c.* Duluth, Minnesota	640
NUX	*b.* Sotoyomo	988
NUZ	*c.* Astoria, Oregon	636
NVD	*c.* Juneau, Alaska	560
NVE	*b.* Utah	1006
NVF	*b.* Uncas NVF	1006
NVH	*c.* Ketchikan	560
NVJ	*b.* Wompatuck	1015
NVK	*b.* Vermont	1007
NVL	*c.* Seattle NVL	651
NVP	*b.* Villalobos	1007
NVR	*b.* Virginia NVR	1007
NVS	*b.* Farragut	930
NVT	*b.* Vulcan	1007
NVU	*b.* Bagley	902
NVV	*b.* Barney	903
NVW	*b.* Biddle	905
NVX	*b.* Blakely	905
NVZ	*b.* Dahlgren	921
NWB	*b.* Delong	922

		PAGE			PAGE
NAJZ	*b.* Welles	1009	NATM	*b.* Woodbury	1015
NAKD	*b.* Ajax NAKD ..	897	NATS	*b.* Umpqua	1006
NAKL	*b.* Heather	938	NATT	*b.* Waters	1009
NAKN	*b.* Hibiscus	939	NAVM	*b.* Explorer	929
NAKS	*c.* Lightvessel No. 70..	645	NAVS	*b.* Stribling	990
NAKT	*c.* Lightvessel No. 69..	645	NAXJ	*b.* Montgomery NAXJ	963
NAKV	*b.* Ivy	942	NAXK	*b.* Murray	965
NAKX	*b.* Kilty	946	NAXS	*b.* O.15	969
NALC	*b.* Lapwing	955	NAXT	*b.* O.10	969
NALP	*b.* Kingfisher NALP ..	946	NAZC	*b.* Thompson NAZC ..	1004
NALR	*b.* Taylor	1003	NAZJ	*c.* Lightvessel No. 34..	644
NALS	*c.* Lightvessel No. 87..	646	NAZL	*b.* Lamberton.. ..	955
NALT	*b.* Ringgold	979	NAZM	*b.* Kennedy	945
NALV	*b.* Laurel NALV ..	955	NAZP	*b.* Bagaduce	902
NALZ	*b.* Stoddert	990	NAZQ	*b.* Tadousac	1003
NAMB	*b.* Larkspur	955	NAZR	*c.* Lightvessel No. 46..	645
NAMC	*b.* O.7	969	NAZS	*b.* Kalmia	945
NAMD	*b.* Reno NAMD ..	979	NEBF	*b.* Constitution ..	917
NAMG	*b.* General Alava ..	933	NEBJ	*b.* Meade	961
NAMN	*b.* Narragansett NAMN	966	NEBV	*b.* H.9	937
			NECD	*b* S.P. 2225	989
NAMR	*b.* O.3	969	NECK	*b.* Farenheit	929
NAMS	*c.* Lightvessel No. 74..	645	NECP	*b.* Peerless NECP ..	973
NAMT	*b.* Boggs	906	NECR	*b.* Colorado	917
NAMV	*b.* Madrona	957	NECT	*b.* Penguin NECT ..	973
NAMX	*b.* O.4	969	NECV	*b.* Palmer	972
NAMZ	*b.* O.5	969	NEDB	*b.* Lexington NEDB ..	955
NANB	*b.* O.6	969	NEDF	*b.* Constellation ..	917
NAND	*b.* O.8	969	NEDG	*b.* Philip	874
NANQ	*b.* Robin	980	NEDJ	*b.* West Virginia ..	1013
NANS	*c.* Lightvessel No. 47..	645	NEDX	*b.* Nero	966
NANS	*b.* Mangrove	958	NEFC	*b.* H.6	937
NANT	*c.* Lightvessel No. 5 ..	644	NEFL	*b.* Swallow	1001
NANZ	*b.* Farquhar	930	NEFS	*b.* S.P. 181	988
NAPG	*b.* Seattle NAPG ..	985	NEFX	*b.* Xarifa	1016
NAPK	*b.* Stevens	990	NEFZ	*b.* Long Beach ..	956
NAPL	*b.* Talbot	1003	NEGC	*b.* R.18	977
NAPN	*b.* Teal	1003	NEGD	*b.* Luce	957
NAPP	*c.* Lightvessel No. 42..	645	NEGF	*b.* Dent	922
NAPR	*b.* Camden NAPR ..	909	NEGK	*b.* R.19	977
NAPS	*b.* Magnolia	957	NEGS	*b.* Fortune	931
NAPT	*b.* Amaranth	899	NEJB	*b.* Eagle 1	924
NAPV	*b.* Maple NAPV ..	959	NEJC	*b.* Eagle 2	924
NAQB	*c.* Lightvessel No. 20..	644	NEJD	*b.* Eagle 3	924
NAQC	*b.* Piscataqua	975	NEJF	*b.* Eagle 4	924
NAQF	*b.* Widgeon	1014	NEJG	*b.* Eagle 5	924
NAQJ	*b.* Rail	978	NEJJ	*b.* Eagle 6	924
NAQM	*b.* S.P. 2047	989	NEJK	*b.* Eagle 7	924
NAQS	*c.* Lightvessel No. 3 ..	644	NEJL	*b.* Eagle 8	924
NAQV	*b.* Marigold	959	NEJM	*b.* Eagle 9	924
NARC	*b.* Maryland NARC ..	959	NEJN	*b.* Eagle 10	924
NARF	*b.* Wandank	1008	NEJP	*b.* Eagle 11	924
NARG	*b.* Chemung	913	NEJQ	*b.* Eagle 12	924
NARN	*b.* Montauk	963	NEJR	*b.* Eagle 13	924
NARP	*b.* Aramis	900	NEJS	*b.* Eagle 14	924
NARR	*b.* William Jones ..	1014	NEJT	*b.* Eagle 15	924
NARS	*c.* Lightvessel No. 44..	645	NEJV	*b.* McGourty	960
NART	*c.* Lightvessel No. 1 ..	644	NEJX	*b.* Eagle 17	924
NARV	*c.* Lightvessel No. 11..	644	NEJZ	*b.* Eagle 18	925
NARZ	*b.* R.20	977	NEKB	*b.* Eagle 19	925
NASB	*c.* Brenton Reef Light Vessel No. 39 ..	637	NEKC	*b.* Scally	984
			NEKD	*b.* Bothwell NEKD ..	907
NASC	*c.* Lightvessel No. 48..	645	NEKF	*b.* Earp	926
NASG	*b.* Sumac	999	NEKG	*b.* Eagle 23	925
NASM	*b.* O.16	969	NEKK	*b.* Eagle 25	925
NASV	*b.* R.15	977	NEKN	*b.* Falcon	929
NASX	*b.* R.16	977	NEKP	*b.* Harbor Tug No. 74	937
NATG	*b.* Bell	904	NEKQ	*b.* Champlin	912
NATJ	*b.* Wickes	1014	NEKR	*b.* Hercules NEKR ..	939

		PAGE
NICD	*b.* Eagle 53	926
NICF	*b.* Eagle 54	926
NICG	*b.* Eagle 55	926
NICJ	*b.* Eagle 56	926
NICK	*b.* Eagle 57	926
NICL	*b.* Eagle 58	926
NICM	*b.* Eagle 59	926
NICN	*b.* Eagle 60	926
NICP	*b.* Cygan	921
NICQ	*b.* V-1 NICQ	1006
NICR	*b.* V-2 NICR	1006
NICS	*b.* V-3 NICS	1006
NICT	*b.* V-4	1006
NICV	*b.* V-5 NICV	1006
NICX	*b.* V-6 NICX ..	1006
NICZ	*b.* V-7	1006
NIDB	*b.* Quigley	976
NIDC	*b.* Stellenwerf ..	990
NIDD	*b.* V-8	1006
NIDF	*b.* Despatch	922
NIDG	*b.* Richards	979
NIDJ	*b.* V-9	1006
NIDL	*b.* Mehalatos	961
NIFB	*b.* Crane NIFB ..	919
NIFC	*b.* Ramsey NIFC ..	978
NIFD	*b.* Ellis NIFD ..	928
NIFG	*b.* Fuller	932
NIFJ	*b.* Percival	974
NIFL	*b.* Hamilton NIFL ..	937
NIFM	*b.* Howard NIFM ..	940
NIFN	*b.* Thomas NIFN ..	1003
NIFP	*b.* Neches	966
NIFQ	*b.* Pecos	973
NIFR	*b.* Torpeto Test Barge No. 1	1005
NIFS	*b.* Torpedo Test Barge No. 2	1005
NIFV	*b.* Cyan	921
NIGB	*b.* McCook	960
NIGC	*b.* McCalla	960
NIGD	*b.* Kalk	945
NIGF	*b.* Ingram	942
NIGG	*b.* McDermut	960
NIGJ	*b.* Laub	955
NIGK	*b.* McLanahan ..	961
NIGL	*b.* Edwards	928
NIGN	*b.* Ballard	903
NIGP	*b.* Swasey	1001
NIGQ	*b.* John Francis Burns	944
NIGR	*b.* Fred J. Talbot ..	932
NIGS	*b.* Yarnall	1016
NIGT	*b.* Cook NIGT ..	918
NIJB	*b.* Curlew	920
NIJF	*b.* Turkey	1005
NIJG	*b.* Partridge	972
NIJJ	*b.* Bobolink	906
NIJK	*b.* Lark	953
NIJL	*b.* Osprey	971
NIJM	*b.* Seagull	985
NIJN	*b.* Flamingo	931
NIJP	*b.* Swan NIJP ..	1001
NIJQ	*b.* Whippoorwill ..	1013
NIJR	*b.* Bittern	905
NIJS	*b.* Sanderling	983
NIJT	*b.* Auk	902
NIJV	*b.* Chewink	913
NIJX	*b.* Gannet	933
NIKB	*b.* Mallard NIKB ..	958
NIKC	*b.* Ortolan	971
NIKD	*b.* Peacock NIKO ..	973
NIKF	*b.* Pigeon NIKF ..	974
NIKG	*b.* Redwing	979
NIKK	*b.* Sandpiper ..	983
NIKL	*b.* Vireo	1007
NIKM	*b.* Warbler	1008
NIKN	*b.* Willet	1014
NIKP	*b.* Woodcock NIKP ..	1015
NIKQ	*b.* Quail	976
NIKR	*b.* Eider NIKR ..	928
NIKS	*b.* Thrush	1004
NIKT	*b.* Tern NIKT ..	1003
NIKV	*b.* Cormorant NIKV ..	918
NIKX	*b.* Grebe NIKX ..	935
NIKZ	*b.* Raven NIKZ ..	978
NILB	*b.* T. 1	1002
NILC	*b.* R.1	977
NILD	*b.* R.2	977
NILF	*b.* R.3	977
NILG	*b.* R.4	977
NILJ	*b.* R.5	977
NILK	*b.* R.6	977
NILL	*b.* R.7	977
NILM	*b.* R.8	977
NILN	*b.* R.9	977
NILP	*b.* R.10	977
NILQ	*b.* R.11	977
NILR	*b.* R.12	977
NILS	*b.* R.13	977
NILT	*b.* R.14	977
NILV	*b.* R.21	977
NILX	*b.* R.22	977
NILZ	*b.* R.23	977
NIMB	*b.* R.24	977
NIMC	*b.* R.25	978
NIMD	*b.* R.26	978
NIMF	*b.* R-27	978
NIMG	*b.* S.1	981
NIMJ	*b.* S.2	981
NIMK	*b.* S.3	981
NIML	*b.* S.4	981
NIMM	*b.* S.5	981
NIMN	*b.* S.6	981
NIMP	*b.* S.7	981
NIMQ	*b.* S.8	981
NIMR	*b.* S.9	981
NIMS	*b.* S.10	981
NIMT	*b.* S.11	981
NIMV	*b.* S.12	981
NIMX	*b.* S.13	981
NIMZ	*b.* S.14	981
NINB	*b.* S.15	981
NINC	*b.* S.16	981
NIND	*b.* S.17	981
NINF	*b.* S.18	981
NING	*b.* S.19	981
NINJ	*b.* S.20	981
NINK	*b.* S.21	981
NINL	*b.* S.22	981
NINM	*b.* S.23	981
NINN	*b.* S.24	981
NINP	*b.* S.25	982
NINQ	*b.* S.26	982
NINR	*b.* S.27	982
NINS	*b.* S.28	982
NINT	*b.* S.29	982
NINV	*b.* S.30	982
NINX	*b.* S.31	982
NINZ	*b.* S.32	982

		PAGE			PAGE
NOML	*b.* Sub-chaser 190 ..	994	NOTN	*b.* Sub-chaser 303 ..	997
NOMM	*b.* Sub-chaser 191 ..	994	NOTP	*b.* Sub-chaser 304 ..	997
NOMN	*b.* Sub-chaser 192 ..	994	NOTQ	*b.* Sub-chaser 305 ..	997
NOMP	*b.* Sub-chaser 193 ..	994	NOTR	*b.* Sub-chaser 306 ..	997
NOMQ	*b.* Sub-chaser 194 ..	994	NOTS	*b.* Sub-chaser 307 ..	997
NOMR	*b.* Sub-chaser 195 ..	994	NOTT	*b.* Sub-chaser 308 ..	997
NOMS	*b.* Sub-chaser 196 ..	994	NOTV	*b.* Sub-chaser 309 ..	997
NONJ	*b.* Sub-chaser 206 ..	995	NOTX	*b.* Sub-chaser 310 ..	997
NONL	*b.* Sub-chaser 208 ..	995	NOVC	*b.* Sub-chaser 320 ..	997
NONN	*b.* Sub-chaser 210 ..	995	NOVF	*b.* Sub-chaser 322 ..	997
NONP	*b.* Sub-chaser 211 ..	995	NOVL	*b.* Sub-chaser 326 ..	997
NONQ	*b.* Sub-chaser 212 ..	995	NOVN	*b.* Sub-chaser 328 ..	997
NONR	*b.* Sub-chaser 213 ..	995	NOVP	*b.* Sub-chaser 329 ..	998
NONS	*b.* Sub-chaser 214 ..	995	NOVQ	*b.* Sub-chaser 330 ..	998
NONT	*b.* Sub-chaser 215 ..	995	NOVR	*b.* Sub-chaser 331 ..	998
NONV	*b.* Sub-chaser 216 ..	995	NOVS	*b.* Sub-chaser 332 ..	998
NONX	*b.* Sub-chaser 217 ..	995	NOVZ	*b.* Sub-chaser 336 ..	998
NONZ	*b.* Sub-chaser 218 ..	995	NOXC	*b.* Sub-chaser 338 ..	998
NOPB	*b.* Sub-chaser 220 ..	995	NOXD	*b.* Sub-chaser 339 ..	998
NOPC	*b.* Sub-chaser 221 ..	995	NOXF	*b.* Sub-chaser 340 ..	998
NOPF	*b.* Sub-chaser 223 ..	995	NOXG	*b.* Sub-chaser 341 ..	998
NOPG	*b.* Sub-chaser 224 ..	995	NOXQ	*b.* Sub-chaser 351 ..	998
NOPK	*b.* Sub-chaser 226 ..	995	NOXR	*b.* Sub-chaser 352 ..	998
NOPM	*b.* Sub-chaser 228 ..	995	NOXS	*b.* Sub-chaser 353 ..	998
NOPN	*b.* Sub-chaser 229 ..	995	NOXT	*b.* Sub-chaser 354 ..	998
NOPP	*b.* Sub-chaser 230 ..	995	NOXX	*b.* Sub-chaser 356 ..	998
NOPQ	*b.* Sub-chaser 231 ..	995	NOZC	*b.* Sub-chaser 408 ..	998
NOPR	*b.* Sub-chaser 232 ..	995	NOZD	*b.* Sub-chaser 409 ..	998
NOPV	*b.* Sub-chaser 235 ..	995	NOZJ	*b.* Sub-chaser 412 ..	998
NOPX	*b.* Sub-chaser 236 ..	995	NOZK	*b.* Sub-chaser 413 ..	998
NOPZ	*b.* Sub-chaser 237 ..	995	NOZR	*b.* Sub-chaser 419 ..	998
NOQB	*b.* Sub-chaser 238 ..	995	NOZS	*b.* Sub-chaser 420 ..	999
NOQC	*b.* Sub-chaser 239 ..	995	NOZT	*b.* Sub-chaser 421 ..	999
NOQK	*b.* Sub-chaser 245 ..	995	NOZV	*b.* Sub-chaser 422 ..	999
NOQL	*b.* Sub-chaser 246 ..	995	NOZX	*b.* Sub-chaser 423 ..	999
NOQN	*b.* Sub-chaser 248 ..	996	NOZZ	*b.* Sub-chaser 424 ..	999
NOQP	*b.* Sub-chaser 250 ..	996	NUBB	*b.* S.P. 43	988
NOQQ	*b.* Sub-chaser 251 ..	996	NUBC	*b.* S.P. 909	989
NOQS	*b.* Sub-chaser 253 ..	996	NUBK	*b.* S.P. 54	988
NOQT	*b.* Sub-chaser 254 ..	996	NUBR	*b.* S.P. 3297	989
NOQV	*b.* Sub-chaser 255 ..	996	NUBS	*b.* S.P. 726	989
NOQZ	*b.* Sub-chaser 257 ..	996	NUBT	*b.* S.P. 522	988
NORC	*b.* Sub-chaser 259 ..	996	NUBZ	*b.* S.P. 340	988
NORG	*b.* Sub-chaser 262 ..	996	NUCF	*b.* Lilac	956
NORJ	*b.* Sub-chaser 263 ..	996	NUCG	*b.* S.P. 573	989
NORK	*b* Sub-chaser 264 ..	996	NUCJ	*b.* S.P. 1234	989
NORL	*b.* Sub-chaser 265 ..	996	NUCK	*b.* S.P. 765	989
NORM	*b.* Sub-chaser 266 ..	996	NUCS	*b.* S.P. 642	989
NORP	*b.* Sub-chaser 268 ..	996	NUCT	*b.* S.P. 265	988
NORQ	*b.* Sub-chaser 269 ..	996	NUCX	*b.* S.P. 214	988
NORR	*b.* Sub-chaser 270 ..	996	NUCZ	*b.* S.P. 249	988
NORS	*b.* Sub-chaser 271 ..	996	NUDF	*b.* S.P. 179	988
NORT	*b.* Sub-chaser 272 ..	996	NUDK	*b.* S.P. 2373	989
NORV	*b.* Sub-chaser 273 ..	997	NUDP	*b.* Yacona	1016
NOSB	*b.* Sub-chaser 276 ..	997	NUDR	*b.* S.P. 707	989
NOSC	*b.* Sub-chaser 277 ..	997	NUFB	*b.* Mohawk NUFB ..	963
NOSD	*b.* Sub-chaser 278 ..	997	NUFG	*b.* S.P. 399	988
NOSK	*b.* Sub-chaser 282 ..	997	NUFL	*b.* S.P. 838	989
NOSL	*b.* Sub-chaser 283 ..	997	NUFM	*b.* Sunflower	1000
NOSM	*b.* Sub-chaser 284 ..	997	NUFN	*b.* S.P. 1149	989
NOSQ	*b.* Sub-chaser 287 ..	997	NUFZ	*b.* S.P. 185	988
NOSR	*b.* Sub-chaser 288 ..	997	NUGB	*b.* S.P. 3218	989
NOSV	*b.* Sub-chaser 291 ..	997	NUGC	*c.* University of Florida	652
NOTB	*b.* Sub-chaser 294 ..	997	NUGD	*b.* Machinac	957
NOTC	*b.* Sub-chaser 295 ..	997	NUGG	*b.* Natoma	966
NOTD	*b.* Sub-chaser 296 ..	997	NUGJ	*b.* Alameda NUGJ ..	897
NOTG	*b.* Sub-chaser 298 ..	997	NUGL	*b.* Laramie	955
NOTJ	*b.* Sub-chaser 299 ..	997	NUGM	*b.* Mattole	959
NOTL	*b.* Sub-chaser 301 ..	997	NUGN	*b.* Patoka	973

		PAGE
ODE	*b.* Dallington	828
ODF	*b.* Indianola	845
ODG	*b.* Inkula	845
ODH	*b.* Neebing	862
ODI	*b.* Winterton	894
ODJ	*b.* Douro ODJ ..	829
ODK	*b.* Bury	815
ODL	*b.* Kolpino	849
ODM	*b.* Kotka	849
ODN	*b.* Kovno	849
ODO	*b.* Livorno	851
ODP	*b.* Narva	861
ODQ	*b.* Wolverton ..	894
ODR	*b.* Scipio	878
ODS	*b.* Smolensk	880
ODT	*b.* Borodino	812
ODV	*b.* Claro	824
ODW	*b.* Dago	827
ODX	*b.* Gourko	839
ODZ	*b.* Stockport	882
OEB	*b.* Cundall	827
OEC	*b.* Grantley	839
OED	*b.* Pensacola OED ..	868
OEE	*b.* Venice	890
OEF	*b.* Trevider	887
OEG	*b.* Fernandina OEG ..	834
OEH	*b.* Norton	864
OEI	*b.* Pomaron	870
OEJ	*b.* Wingate	894
OEK	*b.* Belgravian	810
OEL	*b.* Bosnian	812
OER	*b.* Grelisle	839
OES	*b.* Akera	803
OET	*b.* Brazilier	813
OEU	*b.* Gasconier	836
OEZ	*b.* Burgondier ..	814
OFA	*b.* Absia	802
OFB	*b.* Western	893
OFF	*b.* Taxandrier ..	885
OFG	*b.* Crenatula	827
OFH	*b.* Caprella	816
OFI	*b.* War Jemadar ..	892
OFJ	*b.* War Shikari ..	892
OFK	*b.* British Sailor ..	814
OFL	*b.* War Ranee	892
OFM	*b.* Conia	825
OFN	*b.* War Nizam	892
OFO	*b.* Sunningdale ..	882
OFP	*b.* Edendale	831
OFR	*b.* Flamma	834
OFS	*b.* Lucient	852
OFT	*b.* Airedale	802
OFV	*b.* Loos	851
OFX	*b.* Siptah	880
OGA	*b.* Yokohama	681
OGD	*b.* Helge	678
OGE	*b.* Em. Z. Svitzer ..	677
OGF	*b.* Mexico OGF ..	679
OGH	*b.* Chassie Maersk ..	677
OGI	*b.* Tranquebar ..	680
OGJ	*b.* Hoidehavet ..	678
OGL	*b.* Gudrun Maersk ..	677
OGM	*b.* Moskow	679
OGN	*b.* Danebod	677
OGP	*b.* Kattegat	678
OGQ	*b.* Danebrog OGQ ..	677
OGR	*b.* Johan Siem ..	678
OGS	*b.* Dania OGS ..	677
OGT	*b.* Strandholm ..	680
OGU	*b.* Uffe	681
OGV	*b.* Nidaros	679
OGW	*b.* T. M. Werner ..	680
OGX	*b.* Alexandra OGX ..	676
OGZ	*b.* Newa	679
OHA	*b.* Viborg	681
OHB	*b.* I. D. S. Adolph ..	678
OHB	*c.* Deutsch-Altenburg	568
OHC	*b.* Aggersund ..	676
OHD	*b.* Sydhavet	680
OHE	*b.* Russ OHE	680
OHF	*b.* Falkland	677
OHG	*b.* Bothal	676
OHH	*b.* Aalborg	676
OHI	*b.* Lifland	678
OHJ	*b.* Vidar OHJ ..	681
OHK	*b.* Tjaldur	680
OHL	*b.* Flora OHL ..	677
OHL	*c.* Laaerberg	568
OHN	*b.* Josey	678
OHP	*b.* Wm. Th. Malling ..	681
OHS	*b.* Sirius OHS ..	680
OHT	*b.* Silkeborg	680
OHU	*b.* Vega OHU ..	681
OHV	*b.* Danemark ..	677
OHW	*b.* Frieda OHW ..	677
OHX	*b.* Knud II	678
OHY	*b.* Venus OHY ..	681
OHZ	*b.* Bremersvold ..	676
OIB	*b.* Kentucky OIB ..	678
OIC	*b.* Oregon	679
OID	*b.* Arabian	668
OIE	*b.* Natal	679
OIF	*b.* Arkanzas	676
OIG	*b.* Pacific OIG ..	679
OIH	*b.* Atlantic OIH ..	676
OIK	*b.* Lituania	678
OIM	*b.* Orneborg	679
OIQ	*b.* Pensylvania ..	679
OIR	*b.* Russ OIR	680
OIS	*b.* Virginia OIS ..	681
OIU	*b.* Skanderborg ..	680
OIV	*b.* Sonderborg ..	680
OIX	*b.* Berlin OIX	676
OIY	*b.* Jelling	678
OIZ	*b.* Fredensbro ..	677
OJA	*c.* Helsingfors ..	591
OJB	*c.* Wiborg	591
OJC	*c.* Kotka	591
OJD	*c.* Hango	591
OJE	*c.* Abo	591
OJG	*c.* Waasa	591
OJK	*b.* Sampo	683
OJL	*b.* Tarmo	683
OJM	*b.* Ariadne	683
OJN	*b.* Arcturus OJN ..	683
OJO	*b.* Astrea	683
OJP	*b.* Valtameri	683
OJQ	*b.* Sylfid	683
OKA	*b.* Legie	675
OLB	*b.* Nieuwe Maas ..	722
OLG	*b.* Admiral de Ruyter	715
OLH	*b.* Blitar	716
OLI	*b.* Modjokerto	721
OLJ	*b.* Tjandjver	726
OLK	*b.* Kertosono	720
OLL	*b.* Soekaboemi ..	725
OLM	*b.* Siantar	724
OLN	*b.* Tapanoeli	725

		PAGE
OUR	c. Anholt-Knob	587
OUS	b. Skjold	680
OUT	c. Læsö Trindel ..	587
OUU	c. Gjedser Rev ..	587
OUV	b. Valkyrien OUV ..	681
OUW	c. Drogden	587
OUX	c. Graadyb	587
OUY	c. Vyl	588
OUZ	c. Horns Rev ..	587
OVA	b. Anden April ..	676
OVB	b. Havfruen	677
OVC	b. Nymfen	679
OVD	b. Delfinen	677
OVE	b. Havmanden ..	678
OVF	b. Flyvefisken	677
OVG	b. Galathea	677
OVH	b. Hvalrossen	678
OVI	b. Thetis OVI ..	680
OVJ	b. Söbjörnen	680
OVK	b. Aegir	676
OVL	b. Ran	679
OVN	b. Najaden	679
OVO	b. Ormen	679
OVP	b. Triton OVP ..	681
OVQ	b. Neptun	679
OVR	b. Söridderen	680
OVS	b. Spækhuggeren ..	680
OVT	b. Tumleren	681
OVU	b. Söulven	680
OVV	b. Vindhunden ..	681
OVW	b. Sværdfisken ..	680
OWA	b. Bellona OWA ..	676
OWB	b. Diana OWB ..	677
OWC	b. Falster	677
OWD	b. Fenris	677
OWE	b. Flora	677
OWF	b. Grönsund	677
OWG	b. Guldborgsund ..	677
OWH	b. Hajen	677
OWI	b. Havhesten	677
OWJ	b. Havornen	678
OWK	b. Island	678
OWL	b. T. 7	680
OWM	b. Makrelen	678
OWN	b. T. 8	680
OWO	b. Minekran V ..	679
OWP	b. Minekran VI ..	679
OWQ	b. Narhvalen	679
OWR	b. Nordkaperen ..	679
OWS	b. Rota OWS ..	679
OWT	b. Havkatten	678
OWT	b. Saltholm	680
OWU	b. Springeren	680
OWV	b. Storen	680
OWW	b. Söhunden	680
OWX	b. Sölöven	680
OWY	b. Saelen	680
OWY	b. Thor OWY ..	680
OXA	c. Copenhagen Radio	587
OXA	c. Kjobenhavn Radio	587
OXB	c. Blaavand Radio ..	587
OXC	c. Gjedser	587
OXD	c. Gjedser Havn ..	587
OXE	c. Lyngby Radio ..	587
OXG	b. Prins Christian ..	679
OXH	b. Prinsesse Alexandrine	679
OXJ	c. Thorshavn	590
OXK	c. Tvaeraa	590

		PAGE
OXO	b. Afrika	676
OXP	b. Vinland	681
OXS	b. Smut	680
OXT	b. Nordamerika ..	679
OXU	b. Botnia	676
OXV	b. Stillehavet	680
OXX	b. Alssund	676
OXY	b. Valkyrien	681
OXZ	b. Nordhvalen ..	679
OYA	b. Copenhagen OYA	677
OYB	b. Nordkap	679
OYE	b. Hans Maersk ..	677
OYF	b. Reval OYF ..	679
OYH	b. Ficaria	677
OYI	b. Primula OYI ..	679
OYJ	b. Protector OYJ ..	679
OYK	b. Rota OYK	679
OYL	b. I. C. La Cour ..	678
OYM	b. Nordhavet	679
OYN	b. A. P. Bernstorff ..	676
OYO	b. Russ	680
OYR	b. Asia	676
OYS	b Ribe	679
OYT	b. Fredericia	677
OYV	b. Dronning Maud ..	677
OYW	b. Bryderen	677
OYX	b. Rask	679
OYY	b. Eleonora Moersk ..	677
OYZ	b. Ingolf	678
OZA	b. Peru OZA	679
OZB	b. Hellig Olav ..	678
OZC	b. Oscar II OZC ..	679
OZD	b. United States OZD	681
OZE	b. Astrid	676
OZF	b. Selandia	680
OZG	b. Jutlandia	678
OZH	b. Viking OZH ..	681
OZI	b. Pacific OZI	679
OZJ	b. Store Nordiske ..	680
OZK	b. Fionia	677
OZL	b. Frederik VIII ..	677
OZM	b. Siam	680
OZN	b. Annam	676
OZO	b. Phœnix OZO ..	679
OZP	b. Tongking	680
OZQ	b. Panama OZQ ..	679
OZR	b. Australien	676
OZS	b. Arnold Moersk ..	676
OZU	b. Gullfoss	677
OZV	b. Chile OZV	677
OZW	b. Falstria	677
OZX	b. H. C. Orsted ..	678
OZY	b. Georg Stage ..	677
OZZ	b. Nordlys	679
OGAA	b. L. P. Holmblad	679
OGBA	b. Indien	678
OGDA	b. Hammershus ..	677
OGFA	b. Borglum	676
OGGA	b. Kronborg	678
OGHA	b. Jungshoved ..	678
OGIA	b. Jan	678
OGQA	b. Kong Haakon ..	678
OGVA	b. Delagoa	677
OGWA	b. Kina	678
OGXA	b. Transvaal	680
OHAA	b. Orkild	678
OHBA	b. Jomsborg	678
OHCA	b. Amalienborg ..	676
OHDA	b. Kronprins Frederik	678

		PAGE
PGC	b. Gorontalo	718
PGD	b. Djebres	717
PGE	b. Merauke	721
PGF	b. Ternate	725
PGG	b. Deli	717
PGH	b. Samarinda	724
PGI	b. Madioen	721
PGJ	b. Soerakarta	723
PGK	b. Java	719
PGL	b. Krakatau	720
PGM	b. Sumatra PGM	725
PGN	b. Lombok	721
PGO	b. Celebes	717
PGP	b. Kangean	720
PGQ	b. Karimata	720
PGR	b. Nias	722
PGS	b. Kambangan	720
PGT	b. Billiton	716
PGU	b. Boeton	716
PGV	b. Batjan	716
PGW	b. Karimoen	720
PGY	b. Waaldijk	727
PGZ	b. Westerdijk PGZ	727
PHA	b. Radja	723
PHB	b. Riouw	724
PHC	b. Rotti	724
PHD	b. Arakan	715
PHE	b. Ceylon PHE	717
PHF	b. Djembe	717
PHG	b. Noordwijk	722
PHH	b. Rotterdam PHH	724
PHI	b. Banka	716
PHJ	b. Bawean	716
PHK	b. Boeroe	716
PHL	b. Roepat	724
PHM	b. Rondo	724
PHN	b. New York	722
PHO	b. Soestdijk	725
PHP	b. Zuiderdijk	728
PHQ	b. Iris PHQ	719
PHR	b. Turbinia PHR	726
PHS	b. Voorburg	727
PHT	b. Sitoebondo	725
PHU	b. Buitenzorg	717
PHV	b. Bintang	716
PHW	b. Willem van Driel Sr.	727
PHX	b. Warszawa	727
PHY	b. Borneo	717
PHZ	b. Bengkalis	716
PIA	b. Roode Zee	724
PIB	b. Humber	719
PIC	b. Witte Zee	727
PID	b. Zwarte Zee PID	727
PIE	b. Stad Zwolle	725
PIF	b. Stad Zaandam	725
PIG	b. Valkenburg	726
PIG	b. Stad Valkenburg	725
PIH	b. Friesland	718
PII	b. Stad Arnhem	725
PIJ	b. Zaandijk	727
PIK	b. Bali	715
PIL	b. Gorredijk	718
PIM	b Djambi	717
PIN	b. Garoet	718
PIO	b. Tosari	726
PIP	b. Yseldijk	727
PIQ	b. Schiedijk	724
PIR	b. Veendijk	726
PIS	b. Winterswijk	727
PIT	b. Rijswyk	724
PIU	b. Randwijk	723
PIV	b. Brunswijk	717
PIW	b. Eibergen	718
PIX	b. Ameland	715
PIY	b. Celaeno	717
PIZ	b Kelbergen	720
PJA	c. Aruba	585
PJB	c. Bonaire, Ile	586
PJC	c. Curaçao	586
PKA	c. Sabang Radio	589
PKB	c. Weltevreden Radio	589
PKC	c. Sitoebondo Radio	589
PKD	c. Koepang Radio	588
PKE	c. Amboina Radio	588
PKF	c. Balikpapan Radio	588
PKG	c. Tarakan Radio	589
PKH	c. Soerabaya	589
PKJ	c. Neira Radio	588
PKP	b. Pijnacker Hordjik	681
PKQ	b. Van Outhoourn	682
PKR	b. Van Neck	682
PKS	b. Van Heenskerk	682
PKT	b. Van Waerwyck	683
PKW	b. Juno	681
PKX	c. Bandoeng Radio	588
PLA	b. Telegraaf	682
PLB	b. Zeeslang	683
PLC	b. Koetei	681
PLD	b. Tydeman	682
PLE	b. Van Doorn	682
PLF	b. Sumbawa	682
PLG	b. Hercules PLG	681
PLH	b. Tjikembang	682
PLI	b. Tjisoncari	682
PLJ	b. Tjimanoek	682
PLK	b. Tjitaroem	682
PLL	b. Tjibodas	682
PLM	b. Tjikini	682
PLN	b. Tjiliwong	682
PLO	b. Tjipanas	682
PLP	b. Tjilatjap	682
PLR	b. Tjisalak	682
PLU	b. India PLU	681
PLY	b Mataram PLY	681
PLZ	b. Siboga	681
PMA	b. Ombillon	681
PMB	b. Siberg	682
PMB	b. Van Hoorn	726
PMB	b. Van Waerwijk	726
PMC	b. Houtman	681
PMD	b. Melchior Troub	681
PME	b. Van Overstraeten	682
PMF	b. De Greve	681
PMG	b. S. Jacob	681
PMH	b. Roggeveen	681
PMI	b. Barentsz	681
PMJ	b. Van Cloon	682
PMK	b. Rumphius	682
PMM	b. Van Spilbergen	683
PMN	b. Van der Hagen	682
PMO	b. De Greve	718
PMQ	b. Lemaire	681
PMS	b. Sloet van de Belle	682
PMT	b. Van Linschoten	682
PMU	b. Van Imhoff	682
PMV	b. Van Rees	682
PNQ	b. Amazonas PNQ	663
POZ	c Nauen	598

		PAGE
PPA	*b.* Tapajoz	667
PPB	*b.* Aracaty	664
PPC	*c.* Hellevoetsluis ..	612
PPC	*b.* Araguary	664
PPD	*b.* Assúa	664
PPE	*b.* Capivary	664
PPF	*b.* Corcovado PPF ..	664
PPG	*b.* Gurupy	665
PPK	*b.* Jaguaribe	666
PPL	*b.* Jacuhy	666
PPN	*b.* Mossoro	667
PPO	*b.* Mucury	667
PPS	*b.* Taquary	667
PPU	*b.* Tibagy	667
PPV	*b.* Itapacy	665
PPX	*b.* Itaperuna	665
PPY	*b.* Itaipava	665
PPZ	*b.* Itaituba	665
PQC	*c.* Corvo	568
PQF	*c.* Flores	569
PQH	*c.* Faial	569
PQK	*c.* S. Maria	569
PQL	*c.* Lisbon (Cintra) ..	620
PQM	*c.* S. Miguel	569
PQP	*c.* Porto (Leixões) ..	620
PQT	*c.* Terceira	569
PRG	*c.* Prague	586
PTB	*b.* Massassot	728
PTC	*c.* Fortaleza de Santa Cruz	572
PTI	*c.* Fortaleza de Imbuhy	572
PTJ	*c.* Fortaleza de S. João	572
PTL	*c* Fortaleza de Lage ..	572
PTN	*c.* Nictheroy	573
PTQ	*c.* Quartel General ..	573
PTV	*c.* Villa Militar ..	574
PUA	*b.* Anna PUA	663
PUB	*b.* Tabatinga	667
PUC	*b.* Santarem	667
PUD	*b.* Barbacena	664
PUE	*b.* Guaratuba	665
PUF	*b.* Curityba	664
PUH	*b.* Joazeiro	666
PUI	*b.* Lages	666
PUJ	*b.* Macapa	666
PUK	*b.* Cabedello	664
PUL	*b.* Palmares	667
PUM	*b.* Maranguape ..	666
PUN	*b.* Ilhéous	665
PUO	*b.* Cannavieiras ..	664
PUP	*b.* Jequetinhonha ..	666
PUQ	*b.* Commandatuba ..	664
PUR	*b.* Marahú	666
PUS	*b.* Porto Seguro ..	667
PUT	*b.* Guararapes ..	665
PUU	*b.* Philadelphia PUU	667
PUV	*b.* Brazileira	664
PUY	*b.* Ada PUY	663
PUZ	*b.* Zilka	668
PVA	*b.* Belem	664
PVB	*b.* Campeiro	664
PVD	*b.* Campinas	664
PVE	*b.* Neuquen	667
PVH	*b.* Guanabara	665
PVI	*b.* Marne PVI	666
PVJ	*b.* Piave	667
PVK	*b.* Rio Amazonas ..	667
PVL	*b.* Antonina	664
PVM	*b.* Natal PVM ..	667
PVN	*b.* Brazil PVN ..	664
PVR	*b.* Bocaina	664
PVT	*b.* Braganca	664
PVU	*b.* Guajara	665
PVV	*b.* Ibiapaba	665
PVW	*b.* Mantiquera ..	666
PVY	*b.* Itaquatia	666
PWA	*c.* Morro, Havana ..	585
PWB	*c.* Nueva Gerona ..	585
PWC	*c* Santa Clara ..	585
PWD	*c.* Chaparra	585
PWE	*c.* Baracoa	585
PWF	*c.* Pinar del Rio ..	585
PWG	*c.* La Fé	585
PXA	*b.* Arundo	715
PXB	*b.* Themisto	725
PXC	*b.* Hagno	719
PXD	*b.* Barendrecht ..	716
PXE	*b.* Mijdrecht	721
PXE	*b.* Mydrecht	722
PXF	*b.* Ridderkerk ..	723
PXG	*b.* Apollo PXG ..	715
PXH	*b.* Scipio	724
PXI	*b.* Mirach	721
PXJ	*b.* Sirrah	725
PXK	*b.* Algenib	715
PXL	*b.* Alphard	715
PXM	*b.* Yildum	727
PXN	*b.* Alkaid	715
PXO	*b.* Maashaven.. ..	721
PXP	*b.* Thuban	725
PXQ	*b.* Bellatrix	716
PXR	*b.* Procyon	723
PXS	*b.* Dubhe	718
PXT	*b.* Zwarte Zee PXT ..	728
PXU	*b.* Oostzee	722
PXV	*b.* Ootmarsum ..	722
PXW	*b.* Delft	717
PXX	*b.* Jan V. Nassau ..	719
PXZ	*b.* Juno PXZ	720
PYA	*b.* Johanna	719
PYB	*b.* Jason PYB.. ..	719
PYC	*b.* Orestes	723
PYD	*b.* Sliedrecht	725
PYE	*b.* Wieldrecht	727
PYF	*b.* Callisto	717
PYF	*b.* Ubbergen	726
PYG	*b.* Almelo	715
PYH	*b.* Alkmaar	715
PYI	*b.* Ganymedes.. ..	718
PYI	*b.* Gonymedes.. ..	718
PYJ	*b.* Eemland	718
PYK	*b.* Gaasterland ..	718
PYL	*b.* Kennemerland ..	720
PYM	*b.* Maasland	721
PYN	*b.* Lingestroom ..	721
PYO	*b.* Moerdyk PYO ..	721
PYP	*b.* Ellewoutsdyk ..	718
PYQ	*b.* Batoe	716
PYR	*b.* Ambon	715
PYS	*b.* Ceram	717
PYT	*b.* Calcutta PYT ..	717
PYU	*b.* Crynssen	717
PYV	*b.* Ulysses	726
PYW	*b.* Ceres	717
PYX	*b.* Norddyk	722
PYY	*b.* Kinderdyk PYY ..	720
PYZ	*b.* Rijndijk	723
PZA	*b.* Bussen	717

		PAGE
PZB	*b.* Leersum	720
PZC	*b.* Larenberg	720
PZD	*b.* Hilversum	719
PZE	*b.* Oostdyk	722
PZF	*b.* Trompenberg ..	726
PZG	*b.* Marken	721
PZH	*b.* Zuid-Holland ..	728
PZI	*b.* Rijnsburg	724
PZJ	*b.* Salland	724
PZK	*b.* Macedonia	721
PZL	*b.* Antenor	715
PZM	*b.* Banda	716
PZN	*b.* Waterland	727
PZO	*b.* Zaanland	727
PZP	*b.* Stad Dordrecht ..	725
PZQ	*b.* Stad Zalt Bommel	725
PZR	*b.* Stad Amsterdam ..	725
PZS	*b.* Rozenburg	724
PZT	*b.* Westerdijk PZT ..	727
PZU	*b.* Amstelland ..	715
PZV	*b.* Zeeland PZV ..	728
PZW	*b.* Montferland ..	722
PZW	*b.* Peelland	723
PZX	*b.* Limburgia	721
PZY	*b.* Drente	718
PZZ	*b.* Brabantia	717
RAR	*c.* Odessa	622
RAS	*c.* Vladivostok RAS ..	623
RAU	*c.* Nicolaiewsk RAU	622
REA	*c.* Kronstadt	621
REC	*c.* Hapsal	590
RED	*c.* Libau RED ..	608
REE	*b.* Eclips	775
REF	*c.* Prest	622
REG	*c.* Sébastopol	622
REH	*c.* Kerch	621
REI	*c.* Batoum	621
REJ	*c.* Vladivostok REJ ..	623
RFB	*b.* Standart	779
RFD	*b.* Poliarnaya Zviezda	778
RFF	*b.* Neva RFF ..	777
RFG	*b.* Stréla	779
RFI	*b.* Aleksandria ..	775
RGA	*b.* Rurik	779
RGB	*b.* Andrei Pervozvannyi	775
RGC	*b.* Imperator Pavel I ..	776
RGF	*b.* Tsesarevitch ..	780
RGH	*b.* Slava	779
RGI	*b.* Gromoboi	776
RGJ	*b.* Baian	775
RGK	*b.* Admiral Makharoff	775
RGL	*b.* Rossia RGL ..	778
RGM	*b.* Bogatyr	775
RGN	*b.* Oleg	778
RGO	*b.* Avrora	775
RGP	*b.* Amour	775
RGQ	*b.* Ennissey	776
RGR	*b.* Okean	778
RGS	*b.* Pallada	778
RGT	*b.* Nikolaeff	777
RGU	*b.* Khrabryi	777
RGV	*b.* Koreets	777
RGW	*b.* Bobr	775
RGX	*b.* Sivouch	779
RGZ	*b.* Guiliak	776
RHA	*b.* Novik	777
RHB	*b.* Sibirskii strelok ..	779
RHC	*b.* General Kondratienko	776
RHE	*b.* Herta	776
RHF	*b.* Okhotnik	778
RHI	*b.* Pogranitchnik ..	778
RHK	*b.* Emir Boukharskii ..	776
RHL	*b.* Finn	776
RHN	*b.* Moskvitianiu ..	777
RHO	*b.* Dobrovolets ..	775
RHP	*b.* Vsadnik	781
RHQ	*b.* Gaïdamak	776
RHR	*b.* Oussouriets ..	778
RHS	*b.* Tourkmen Stavropolskii	780
RHT	*b.* Oukraina	778
RHU	*b.* Kazanets	777
RHV	*b.* Strachnyi	779
RHW	*b.* Donskoi Kazak ..	775
RHX	*b.* Zabaikalets.. ..	781
RHZ	*b.* Steregouchtii ..	779
RIA	*b.* Voiskovoi	781
RIB	*b.* Angara	775
RIC	*b.* Oka	778
RID	*b.* Kama	776
RIE	*b.* Pechora	778
RIG	*b.* Soukhona	779
RIJ	*b.* Mezen	777
RIK	*b.* Riga	778
RJS	*b.* Anadyr	775
RKA	*b.* Evstafii	776
RKC	*b.* Ioann Zlatooust ..	776
RKD	*b.* Panteleimon ..	778
RKE	*b.* Tri Sviatitelia ..	786
RKF	*b.* Rostislav	778
RKG	*b.* Sinop	779
RKI	*b.* Gheorgii Pobedonosetz	776
RKL	*b.* Pamiat Merkouria..	778
RKM	*b.* Kagoul	776
RKO	*b.* Donetz	775
RKP	*b.* Ouraletz	778
RKS	*b.* Koubanetz	777
RKT	*b.* Teretz	779
RKU	*b.* Almaz	775
RKV	*b.* Prout	778
RKW	*b.* Dounaii	775
RKX	*b.* Kronstadt	777
RKZ	*b.* Berezan	775
RLB	*b.* Leitenant Chestakoff	777
RLC	*b.* Kapitan Saken ..	777
RLD	*b.* Leitenant Zatsarennyi	777
RLE	*b.* Kapitan Leitenant Baranoff	777
RMA	*b.* Askold	775
RMB	*b.* Zemtchoug	781
RMD	*b.* Oussourri	778
RME	*b.* Mangougai	777
RMF	*b.* Mandjour	777
RMH	*b.* Taimir	779
RML	*b.* Vaiguatch	780
RNB	*b.* Toula	780
RNC	*b.* Kishinev	777
RND	*b.* Vologda RND ..	781
RNE	*b.* Nijni-Novgorod ..	777
RNF	*c.* Fort d'Alexandrovsk	621
RNG	*b.* Saratov	779
RNH	*b.* Ekaterinoslav RNH	775
RNI	*b.* Vélikaia Kniajna Maria Nikolaievna	780
RNJ	*b.* Cherson	775

		PAGE
SDA	*b.* Ragunda	799
SDB	*b.* Fritiof	794
SDC	*b.* Irene SDC	796
SDD	*b.* Convallaria.. ..	793
SDF	*b.* Orania	798
SDG	*b.* Finn SDG	794
SDI	*b.* Marie	797
SDJ	*b.* Ulla	801
SDK	*b.* Kiruna	796
SDL	*b.* Gudmundra ..	795
SDM	*b.* Formosa SDM ..	794
SDN	*b.* Eros SDN	794
SDQ	*b.* Canada SDQ ..	793
SDR	*b.* Sigvar	799
SDT	*b.* Boren	793
SEA	*b.* Konung Gustaf V ..	799
SEB	*b.* Drottning Viktoria	794
SEC	*b.* Skagerak	799
SED	*b.* Malmo	797
SFA	*b.* Hibernia SFA ..	796
SFB	*b.* Saga SFB	799
SFC	*b.* Thule SFC	800
SFD	*b.* Scotia SFD.. ..	799
SFD	*b.* Texas SFD ..	800
SFE	*b.* Indianic	796
SFF	*b.* Hellenic	795
SFG	*b.* Tasmanic	800
SFH	*b.* Australic	792
SFI	*b.* Belos SFI	792
SFJ	*b.* Torne	801
SFL	*b.* Abisko	791
SFM	*b.* Meta	798
SFO	*b.* Vollrath Tham ..	801
SFP	*b.* Sir Ernest Cassel ..	799
SFQ	*b.* Kratos	799
SFR	*b.* Bia	793
SFS	*b.* Africanic	791
SFT	*b.* Atlantic	792
SFU	*b.* Baltic SFU ..	792
SFV	*b.* Kronprins Gustaf Adolf	797
SFW	*b.* Boden	793
SFX	*b.* Narvik	798
SFY	*b.* Kronprinsessan-Margareta	799
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SGA	*b.* Knappingsborg ..	796
SGB	*b.* Kronprinsessan-Victoria	797
SGC	*b.* San Francisco SGC	799
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SGE	*b.* Pedro Christophersen	799
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SGG	*b.* Nordic	798
SGH	*b.* Heimdall	795
SGI	*b.* Lisa Brodin ..	797
SGJ	*b.* Siljan	799
SGK	*b.* Axel Johnson ..	792
SGL	*b.* Stockholm	800
SGM	*b.* Sagoland	799
SGN	*b.* Holmengra	796
SGO	*b.* Balder	792
SGP	*b.* Bele	792
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SGT	*b.* Succia	800
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SGV	*b.* G. D. Kennedy ..	795
SGW	*b.* Valparaiso	801

		PAGE
SGX	*b.* Japan SGX ..	796
SGY	*b.* Ceylon SGY ..	793
SGZ	*b.* Falka	794
SHA	*b.* Bolmen	793
SHB	*b.* Prinsessan-Ingeborg	799
SHC	*b.* Portus	801
SHF	*b.* Yeddo	801
SHG	*b.* Aspen	792
SHH	*b.* Annie Johnson ..	791
SHI	*b.* Anten	792
SHJ	*b.* Lima SHJ	797
SHK	*b.* Drottning Sophia ..	794
SHL	*b.* Kronprins Gustaf ..	797
SHM	*b.* Oscar Fredrik ..	799
SHN	*b.* Bullaren	793
SHO	*b.* Hansa	795
SHP	*b.* Yngaren	801
SHQ	*b.* Tisnaren	801
SHR	*b.* Isbrytaren II ..	796
SHS	*b.* Magda	797
SHT	*b.* Bris	793
SHU	*b.* Faxen	794
SHV	*b.* Oscar Midling ..	799
SHW	*b.* Patricia SHW ..	799
SHX	*b.* Balboa	792
SHY	*b.* Atland	792
SHZ	*b.* Turbinia SHZ ..	801
SIA	*b.* Anglia SIA.. ..	791
SIB	*b.* Luguria SIB ..	797
SIC	*b.* Massiliö	798
SID	*b.* Catalonia	793
SIE	*b.* Harald	795
SIF	*b.* Vinga	801
SIG	*b.* Gullmarn	795
SIH	*b.* Gustavsholm ..	795
SII	*b.* Odessa SII	798
SIJ	*b.* Varna	801
SIK	*b.* Cavalla	793
SIL	*b.* Stureholm	800
SIM	*b.* Hermes SIM ..	795
SIN	*b.* Egil	794
SIO	*b.* Nippon SIO ..	798
SIP	*b.* Carmen SIP ..	793
SIQ	*b.* Holmia	796
SIR	*b.* Salen	799
SIS	*b.* Svarten	800
SIT	*b.* Mertainen	798
SIU	*b.* Buenos Aires SIU	793
SIV	*b.* Italia SIV	796
SIW	*b.* Bernicia	793
SIX	*b.* Lombardia SIX ..	797
SIY	*b.* Ragne	799
SIZ	*b.* Sonja	800
SJA	*b.* Alstern	791
SJB	*b.* Gloria SJB.. ..	795
SJC	*b.* Mjörn	798
SJD	*b.* Elsa	794
SJF	*b.* Gunborg	795
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SJH	*b.* H. Uner	796
SJJ	*b.* Viken	801
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SJM	*b.* Drottningholm ..	794
SJN	*b.* Textil	800
SJP	*b.* Bravalla	793
SJQ	*b.* Aries	792
SJR	*b.* Norrkoping.. ..	798
SJT	*b.* Porjus	799

		PAGE
SJU	*b.* Graecia	795
SJV	*b.* Gallia	794
SJX	*b.* Immeln	796
SJZ	*b.* Malmen	797
SKC	*b.* Elmaren	794
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SKG	*b.* Reserv	799
SKH	*b.* Adolf	791
SKI	*b.* Benares	793
SKK	*b.* Braheholm	793
SKL	*b.* Hogland	796
SKN	*b.* Nordland	798
SKO	*b.* Gotaland	795
SKP	*b.* Nyland	798
SKQ	*b.* Inland	786
SKR	*b.* Smyrna	800
SKT	*b.* Uppland	801
SKU	*b.* Smaland	800
SKV	*b.* Hemland	795
SKX	*b.* Salonica SKX	799
SKY	*b.* Borg	793
SKZ	*b.* Glan	795
SLA	*b.* Thyra SLA	801
SLB	*b.* Gerd	795
SLD	*b.* O. A. Brodin	798
SLF	*b.* Aldebaran SLF	791
SLH	*b.* Antares SLH	791
SLJ	*b.* Olof Brodin	798
SLK	*b.* B. G. Kronberg	793
SLL	*b.* Storvik	800
SLM	*b.* Fagervik	794
SLN	*b.* Karlavik	796
SLO	*b.* Nils Uner	798
SLP	*b.* Gellivare	795
SLQ	*b.* Kalix	796
SLR	*b.* Polcirkeln	799
SLS	*b.* Svarton	800
SLT	*b.* Grangesberg	795
SLU	*b.* C. F. Liljevalch	793
SLV	*b.* Astur	792
SLW	*b.* Ester	794
SLX	*b.* Therese	800
SLY	*b.* Augusta	792
SLZ	*b.* August Leffler	792
SMB	*b.* Marta	797
SMC	*b.* Lygnern	797
SMD	*b.* Lord	797
SME	*b.* Gertrud	795
SMF	*b.* Hjalmar Blomberg	796
SMG	*b.* Unden	801
SMH	*b.* Indus	796
SMI	*b.* Anna SMI	791
SMJ	*b.* Oscar	798
SML	*b.* Gelfe	795
SMP	*b.* Moria	798
SMQ	*b.* Tilia	801
SMT	*b.* Bolivia	793
SMV	*b.* Calabria SMV	793
SNA	*b.* Alagôas	663
SNB	*b.* Bahia SNB	664
SNC	*b.* Ceara SNC	664
SND	*b.* Deodoro	665
SNE	*b.* Pará SNE	667
SNF	*b.* Floriano	665
SNH	*b.* Paraná SNH	667
SNI	*c.* Ilha das Cobras	572
SNJ	*b.* Jose Bonifacio	666
SNK	*b.* Santa Catharina	667
SNL	*b.* Laurindo Pitta	666
SNM	*b.* Minas Geraes SNM	666
SNN	*c.* Abrolhos	571
SNO	*b.* Sergipe SNO	667
SNP	*b.* São Paulo SNP	667
SNQ	*c.* Ilha do Boqueirão	573
SNR	*c.* Natal Norte	573
SNS	*b.* Rio Grande do Norte	667
SNU	*c.* Ladario	573
SNV	*c.* Villegaignon	574
SNW	*c.* Armação	571
SNZ	*c.* Ilha Raza	573
SOA	*b.* Amazonas SOA	663
SOB	*b.* Barroso	664
SOC	*b.* Benjamin Constant	664
SOD	*c.* Anhatomirim	571
SOE	*b.* Carlos Gomes	664
SOG	*b.* Matto Grosso	666
SOH	*c.* Ilha do Governador	573
SOJ	*b.* Jaguarão	666
SOK	*b.* Sargento Albuquerque	667
SOL	*b.* Belmonte	664
SOM	*c.* Sao Luiz	573
SOP	*b.* Parahyba	667
SOQ	*c.* Ilha de Mocangue	573
SOR	*b.* Rio Grande do Sul	667
SOT	*b.* Tiradentes	667
SOU	*b.* Republica SOU	667
SOV	*c.* Escola, Naval	572
SOW	*b.* Sousmarin F 1	667
SOX	*b.* Sousmarin F 3	667
SOY	*b.* Piáuhy	667
SOZ	*b.* Sousmarin F 5	667
SPA	*c.* Amaralina	571
SPB	*c.* Belém. Pará	572
SPE	*c.* Escola Radio	572
SPJ	*c.* Juncção	573
SPN	*c.* Fernando de Noronha	572
SPO	*c.* Olinda, Pernambuco	573
SPS	*c.* Mont' Serrat	573
SPT	*c.* Cabo de São Thomé	572
SPY	*c.* Babylonia	572
SQC	*c.* Cruzeiro do Sul	572
SQL	*c.* Labrea, Brazil	573
SQM	*c.* Manáos	573
SQN	*c.* Senna Madureira	573
SQR	*c.* Rio Branco, Acre	573
SQS	*c.* Santarém, Pará	573
SQT	*c.* Tarauacá	573
SQV	*c.* Porto Velho	573
SQX	*c.* Xapury	574
SRA	*b.* Rio de Janeiro SRA	667
SRB	*b.* Minas Geraes SRB	666
SRC	*b.* São Paulo SRC	667
SRD	*b.* Ceará SRD	664
SRE	*b.* Bahia SRE	663
SRF	*b.* Acre	663
SRG	*b.* Satellite	667
SRH	*b.* Sergipe SRH	667
SRI	*b.* Laguna	666
SRJ	*b.* Aymoré	664
SRK	*b.* Maranhão	666
SRL	*b.* Olinda	667
SRM	*b.* Brazil SRM	664
SRO	*b.* Mercêdes SRO	666
SRP	*b.* Oyapock	667
SRQ	*b.* Pará SRQ	667
SRR	*b.* Servulo Durado	667

		PAGE
SRS	*b.* Manáos	666
SRT	*b.* Ruy Barboza	667
SRU	*b.* Iris SRU	665
SRV	*b* Prudente de Moraes	667
SRW	*b.* Sirio	667
SRX	*b.* Almirante Jaceguay	663
SRY	*b.* Javary	666
SRZ	*b.* Florianopolis	665
SSA	*b.* Wenceslau Braz	668
SSB	*b.* Commandante Belham	664
SSC	*b.* Goyaz	665
SSD	*b.* Pyrineus	667
SSE	*b.* Purus	667
SSF	*b.* Itú	666
SSG	*b.* Ayruoca	664
SSH	*b.* Curvello	665
SSI	*b.* Jaboatao	666
SSJ	*b.* Avaré	664
SSK	*b.* Inga	665
SSL	*b.* Atalaia	664
SSN	*b.* Cuyaba	665
SSP	*b.* Poconé	667
SSR	*b.* Sobral	667
SSS	*b.* Alfenas	668
SST	*b.* Caxias	664
SSU	*b.* Bagé	664
SSV	*b.* Leopoldina	666
SSW	*b.* Caxambu	664
SSX	*b.* Baependy	664
SSY	*b.* Santos SSY	667
SSZ	*b.* Uberaba	667
STA	*b.* Itapura	665
STB	*b.* Itatinga	666
STC	*b.* Itassucê	666
STD	*b.* Itapuhy	665
STE	*b.* Itaquera	665
STF	*b.* Itagiba	665
STG	*b.* Itajuba	665
STH	*b.* Itapema	665
STI	*b.* Itapuca	665
STJ	*b.* Itauba	666
STK	*b.* Itabera	665
STL	*b.* Itamaraca	665
STM	*b.* Therezina	667
STN	*b.* Tocantins	667
STO	*b.* Taubate	667
STP	*b.* Parnahyba	667
STQ	*b.* Benevente	664
STR	*b.* Campos	664
STS	*b.* Iguassú	665
STT	*b.* Sabara	667
STV	*b.* Pelotas	667
STW	*b.* Victoria STW	667
STX	*b.* Alegrete	663
STY	*b.* Aracaju	664
STZ	*b.* Mandú	666
SUA	*b.* Mahroussa	683
SUB	*c.* Port Said	589
SUC	*c.* Abu Zabal	589
SUD	*c.* Port Sudan Radio	628
SUF	*b.* Aida	683
SUG	*b.* Abdel Moneim	683
SUH	*c.* Alexandria	589
SUK	*c.* Khartoum SUK	628
SVA	*b.* Adriaticos	711
SVB	*b.* Chios	712
SVC	*b.* Andros	711
SVD	*b.* Peloponissos	714

		PAGE
SVE	*b.* Erissos	712
SVF	*b.* Mykali	713
SVG	*b.* Ghoissa	712
SVH	*b.* Hydra SVH	713
SVI	*b.* Nicolaos Athanassulis	713
SVJ	*b.* Antigoni	711
SVK	*b.* Kalypso Vergotti	713
SVL	*b.* Elpis	712
SVM	*b.* Athina	712
SVN	*b.* Ourana	714
SVO	*b.* Ermoupolis	712
SVO	*b.* Melpo	713
SVP	*b.* Patris	714
SVR	*b.* Archangelos	711
SVS	*b.* Andreas	711
SVT	*b.* Themistocles SVT	714
SVU	*b.* Rokos Vergottis	714
SVV	*b.* Megali Hellas	713
SVW	*b.* Istros	713
SVX	*b.* Antonios	711
SVY	*b.* Irene	713
SVZ	*b.* Dirphys	712
SWA	*b.* Aeon	711
SWB	*b.* Pantias Rallis	714
SWC	*b.* Dionyssios Stathatos	712
SWD	*b.* Efstathios	712
SWE	*b.* Kea	713
SWE	*b.* Youlia	713
SWF	*b.* Michael Bistis	713
SWG	*b.* Argolis	711
SWH	*b.* Elpidophorus	712
SWI	*b.* Aristidis Bistis	711
SWJ	*b.* Iolkos	713
SWK	*b.* Evangelos	712
SWL	*b.* Hilarius	713
SWL	*b* Livanos	713
SWM	*b.* Maroudio Inglessi	713
SWN	*b.* Nora Saliari	714
SWO	*b.* Ellin	712
SWP	*b.* Panaghis	714
SWQ	*b.* Othon Stathatos	714
SWR	*b.* Ioannis Vatis	713
SWS	*b.* Granicos	712
SWT	*b.* Iro	713
SWU	*b.* Eperoki	712
SWV	*b.* Zakynthos	715
SWW	*b.* Zanos Sifneo	715
SWX	*b.* Adamantios Lemos	711
SWY	*b.* Michael L. Embiricos	713
SWZ	*b.* Kate	713
SXA	*c.* Athènes	600
SXB	*c.* Athens, No. 2	600
SXC	*c.* Salonique	601
SXD	*c.* Dede-Aghadj	600
SXF	*c.* Fassa	600
SXK	*c.* Corfou	600
SXL	*c.* Salamis	600
SXP	*c.* Poros	600
SXS	*c.* Syra	601
SXT	*c.* Thassos	601
SYA	*b.* Averoff	712
SYB	*b.* Velos	715
SYC	*b.* Lonchi	713
SYD	*b.* Doxa	712
SYE	*b.* Ierax	713
SYF	*b.* Sfendoni	714
SYG	*b.* Nea Gennea	713
SYH	*b.* Hydra SYH	713

		PAGE
SYI	*b.* Aspis	712
SYJ	*b.* Kanaris	713
SYK	*b.* Keravnos	713
SYL	*b.* Leon	713
SYM	*b.* Amfitrite	711
SYN	*b.* Niki	713
SYO	*b.* Aetos	711
SYP	*b.* Panthir	714
SYQ	*b.* Psara	714
SYR	*b.* Nafkratousa	713
SYS	*b.* Spetsai SYS	714
SYT	*b.* Thyella	714
SYU	*b.* Alcyon	711
SYV	*b.* Aigli	711
SYW	*b.* Arethousa	711
SYX	*b.* Daphni	712
SYY	*b.* Doris SYY	712
SYZ	*b.* Thétis SYZ	714
SZA	*b.* Helli	713
SZB	*b.* Limnos	713
SZC	*b.* Kilkis SZC	713
SZD	*b.* Nikopolis	714
SZE	*b.* Promithefs	714
SVAS	*b.* Theofano	714
SVBS	*b.* Popi	714
SWNS	*b.* Meandros	713
SWOS	*b.* Vassilios Destounis	714
SWPS	*b.* Athanasios	712
SWQS	*b.* Daphne SWQS	712
SWRS	*b.* Nicolaos Zafirakis	713
SWSS	*b.* Evros	712
SWTS	*b.* Demetrios Pandelis	712
SWUS	*b.* Eugenie S. Embiricos	712
SWVS	*b.* Eleni Stathatos	712
SWWS	*b.* Maria Stathatos	713
SWXS	*b.* Polyktor	714
SWYS	*b.* Eugenia	712
SWZS	*b.* Achilles SWZS	711
TFA	*c.* Reykjavik Radio	602
TFB	*c.* Flatey á Breidafirdi	602
TFG	*b.* Gullfoss	720
TFI	*b.* Thor TFI	720
TFJ	*b.* Egill Skallagrimsson	720
TFL	*b.* Lagarfoss	720
TFO	*b.* Thorolfur	720
TFR	*b.* Skallagrimur	720
TFS	*b.* Sterling TFS	720
TGA	*b.* Daphne TGA	712
TGB	*b.* Pelops	714
TGC	*b.* Pinios	714
TGD	*b.* Spetzai TGD	714
TGE	*b.* Elsie	712
TGF	*b.* Ismene	713
TGG	*b.* Spyridon	714
TGH	*b.* Eftichia Vergotti	712
TGI	*b.* Agapi	711
TGJ	*b.* Thyra	715
TGK	*b.* Syros	714
TGL	*b.* Sifnos	714
TGM	*b.* Milos	713
TGN	*b.* Tinos	715
TGO	*b.* Ioannis	713
TGP	*b.* Nea Ellas	713
TGQ	*b.* Aris	711
TGR	*b.* Delphin	712
TGS	*b.* Cephalonia TGS	712
TGT	*b.* Atromitos	712
TGV	*b.* Arcadia TGV	711
TGW	*b.* Sparti	714

		PAGE
TGX	*b.* Byzantion	712
TGY	*b.* Fotis	712
TGZ	*b.* Elena Margarita	712
THA	*b.* Emmanuel	712
THB	*b.* Tharros	714
THC	*b.* Policos	714
THD	*b.* Chalkis	712
THE	*b.* Argo	711
THF	*b.* Miltiades THF	713
THG	*b.* Triti	712
THH	*b.* Nauplion	713
THI	*b.* Katingo A. Lemon	713
THJ	*b.* Paralos	714
THK	*b.* Telemachos	714
THL	*b.* Alexandros Kaloutas	711
THM	*b.* Margarita	713
THN	*b.* Marie Z. Michalinos	713
THO	*b.* Aristides	711
THP	*b.* Prodromos	714
THQ	*b.* Kallirroi Kapari	713
THR	*b.* Rosina	714
THS	*b.* Ioanna THS	713
THT	*b.* Argostoli	711
THU	*b.* Assimina Embiricos	712
THV	*b.* Naxos	713
THW	*b.* Navarchos Koyndouriotis	713
THX	*b.* Iocasti	713
THY	*b.* Cephalonia THY	712
THZ	*b.* Panaghis Vergottis	714
TIA	*b.* Alberto	781
TIB	*b.* Principe de Asturias	788
TIC	*b.* Arenas	782
TID	*b.* Armando TID	782
TIE	*b.* Arno Mendi	782
TIF	*c.* Tiflis	597
TIF	*b.* Arraiz	782
TIG	*b.* Bachi	783
TIH	*b.* Banana	783
TII	*b.* Banderas	783
TIJ	*b.* Bara-bi	783
TIK	*b.* Baracaldo	783
TIL	*b.* Bermeo	783
TIM	*b.* Betis	783
TIN	*b.* Blas de Lezo	783
TIO	*b.* Cabo Creus	783
TIP	*b.* Castro Alen	783
TIQ	*b.* Berja	783
TIR	*b.* Ciervana	784
TIS	*b.* Conde de Abasolo	784
TIT	*b.* Cosme y Jacinta	784
TIU	*b.* Cristina Rueda	784
TIV	*b.* Cristobal Llusa	784
TIW	*b.* Donato	784
TIX	*b.* Durango	784
TIY	*b.* Escolano	785
TIZ	*b.* Espana No. 1	785
TJA	*b.* Espana No. 2	785
TJB	*b.* Espana No. 3	785
TJC	*b.* Espana No. 4	785
TJD	*b.* Espana No. 5	785
TJE	*b.* Espana No. 6	785
TJF	*b.* Felix	785
TJG	*b.* Gloria	785
TJH	*b.* Goizeko Izarra	785
TJI	*b.* Guillermo	785
TJJ	*b.* Isabel de Llusa	786
TJK	*b.* Igualada	785
TJL	*b.* Iturri Urdina	786

		PAGE
TJM	*b.* J. C. Llusa ..	786
TJN	*b.* Joaquin Pujol ..	786
TJO	*b.* Lily	787
TJP	*b.* Manolo	787
TJQ	*b.* Luis Casanova ..	787
TJR	*b.* Madrid TJR ..	787
TJS	*b.* Manu	787
TJT	*b.* Mar Adriatico ..	787
TJU	*b.* Mar Blanco ..	787
TJV	*b.* Mar Caribe ..	787
TJW	*b.* Mar del Plata ..	787
TJX	*b.* Margari	787
TJY	*b.* Marie Elena ..	787
TJZ	*b.* Eugenio Dutrus ..	785
TKA	*b.* Mercurio	787
TKB	*b.* Orzarosa	788
TKC	*b.* Paz de Epalza ..	788
TKD	*b.* Pena Augustina ..	788
TKE	*b.* Pena Cabarga ..	788
TKF	*b.* Pena Rocias ..	788
TKG	*b.* Posta Querol ..	788
TKH	*b.* Previsor	788
TKI	*b.* Ramon de Bikuna	789
TKJ	*b.* Ramon Numbru ..	789
TKK	*b.* Ramonita	789
TKL	*b.* Romeu	789
TKM	*b.* Rontegui	789
TKN	*b.* Rosendo Masia ..	789
TKO	*b.* San Jose	789
TKP	*b.* Santa Ana	789
TKQ	*b.* Sebastian	789
TKR	*b.* Serafin Ballesteros ..	789
TKS	*b.* Tablada	789
TKT	*b.* Teresa	789
TKU	*b.* Torre del Oro ..	790
TKV	*b.* Valentin	791
TKW	*b.* Valmurian	791
TKX	*b.* Viuda de Llusa ..	791
TKY	*b.* Viva	791
TKZ	*b.* Villafranca	791
TLA	*b.* Elanchove	784
TLB	*b.* Tarrasa	789
TLC	*b.* Manuel Carsi ..	787
TLD	*b.* Elcano TLD ..	784
TLE	*b.* Maliano	787
TLF	*b.* Salazar	789
TLG	*b.* Tres Hermanos ..	790
TLH	*b.* Alfonso Perez ..	782
TLI	*b.* Jeronimo Ibran ..	786
TLJ	*b.* Anita	782
TLK	*b.* Consuelo	784
TLL	*b.* Lolin	787
TLM	*b.* Tamesis	789
TLN	*b.* Mercedes TLN ..	787
TLO	*b.* S. Salvador	789
TLP	*b.* Mar Azoff	787
TLQ	*b.* Olavarriaga ..	788
TLR	*b.* Arza-Mendi ..	782
TLS	*b.* Ariz-Mendi ..	782
TLT	*b.* Guernica	785
TLU	*b.* Alfredo	782
TLV	*b.* Agustin	781
TLW	*b.* Pepita Mumbru ..	788
TLX	*b.* Artxanda-Mendi ..	782
TLY	*b.* Arnotegi-Mendi ..	782
TLZ	*b.* Rio Galindo ..	789
TMA	*b.* Tiflis	790
TMB	*b.* Ignacio	785
TMC	*b.* Leonita	787
TMD	*b.* S. Mus	789
TME	*b.* River Clyde ..	789
TMF	*b.* Mar de Irlanda ..	787
TMG	*b.* Cabo Razo	783
TMH	*b.* Cabo Huertas ..	783
TMI	*b.* Cabo Roche ..	783
TMJ	*b.* Domingo Mumbru ..	784
TMK	*b.* Atxeri-Mendi ..	783
TML	*b.* Alu-Mendi ..	782
TMM	*b.* Hamlin TMM ..	785
TMN	*b.* Coria	784
TMO	*b.* Gelves	785
TMP	*b.* Principe de Viana ..	788
TMQ	*b.* Principe de Piamonte	788
TMR	*b.* Antonio TMR ..	782
TMS	*b.* Josefa TMS ..	787
TMT	*b.* Oran	788
TMU	*b.* Suarez No. 2 ..	789
TMV	*b.* Guadiamar ..	785
TMW	*b.* Santi	789
TMX	*b.* Mari-Tere	787
TMZ	*b.* Manuchu	787
TNA	*b.* Chivichiaga ..	784
TNB	*b.* Torrontero	790
TNC	*b.* Agadir TNC ..	781
TND	*b.* Suarez No. 1 ..	789
TNE	*b.* Cisneros	784
TNF	*b.* Antonio de Satrustegui	782
TNG	*b.* Arichachu	782
TNH	*b.* Sarita	789
TOA	*b.* Manuel Arnus ..	787
TOB	*b.* Alfonso XIII ..	782
TOC	*b.* Christobal Colon ..	784
TOD	*b.* Delfina TOD ..	784
TOE	*b.* Florentina ..	785
TOF	*b.* José Estruch ..	786
TPA	*b.* Fram	766
TPB	*b.* Flint	766
TPC	*b.* Fritzöe	766
TPD	*b.* Stolt-Nielsen ..	772
TPE	*b.* Delaware TPE ..	765
TPF	*b.* Louisiana TPF ..	769
TPG	*b.* Mantilla TPG ..	769
TPH	*b.* Nordstrand	770
TPJ	*b.* Anders	764
TPK	*b.* Bertha	764
TPL	*b.* Joh. Ludw. Mowinckel	768
TPL	*b.* Estrella	765
TPM	*b.* Troubadour ..	773
TPN	*b.* Thode Fagelund ..	773
TPO	*b.* Sjomand	771
TPP	*b.* Sörland	772
TPR	*b.* Sierra Nevada ..	771
TPS	*b.* Songa	771
TPT	*b.* Lorentz W. Hansen	769
TPU	*b.* Urd	773
TPV	*b.* Loch Tay	769
TQA	*b.* Gro	767
TQB	*b.* Bur	765
TQC	*b.* Hassel	766
TQD	*b.* Alfred Nobel ..	764
TQE	*b.* Manna Stub ..	769
TQF	*b.* Corona TQF ..	765
TQG	*b.* Tonjer	773
TQH	*b.* Nordkyn TQH ..	769
YQI	*b.* S. B. Lund	771
TQJ	*b.* Asator	764

		PAGE
TQK	*b.* Nyhavn	770
TQL	*b.* Adour	763
TQM	*b.* Klem	768
TQN	*b.* Christian Krogh ..	765
TQO	*b.* Krosfond	768
TQP	*b.* Storfjeld	772
TQQ	*b.* Langford	769
TQR	*b.* Lyderhorn ..	769
TQS	*b.* Modica	769
TQT	*b.* Hermes TQT ..	767
TQU	*b.* Maridal	769
TQV	*b.* Osterdal	770
TQW	*b.* Glittertind	766
TQX	*b.* Modig	769
TQY	*b.* Evanger	765
TQZ	*b.* Malmanger ..	769
TRA	*b.* S. Miguel TRA ..	772
TRB	*b.* S. Jose TRB ..	772
TRC	*b.* Sardinia TRC ..	771
TRD	*b.* S. Andres	772
TRE	*b.* Sevilla	771
TRF	*b.* Segovia	771
TRH	*b.* Poljana	770
TRI	*b.* Tosca	773
TRJ	*b.* Bratland	765
TRK	*b.* Theodore Roosevelt TRK	773
TRL	*b.* Negus	769
TRM	*b.* Alexander Kielland	764
TRN	*b.* Snehaetten ..	771
TRO	*b.* Nordfjeld	769
TRP	*b.* Mod	769
TRQ	*b.* Mimer	769
TRR	*b.* H. K. Waage ..	767
TRS	*b.* Thorhild	773
TRT	*b.* Cissy	765
TRU	*b.* Isfjeld	767
TRV	*b.* Gunny	767
TRW	*b.* Kalken	768
TRX	*b.* Solvaer	771
TRZ	*b.* Felix TRZ ..	766
TSA	*b.* Ronald	771
TSB	*b.* Helder TBS ..	767
TSC	*b.* Hermion TSC ..	767
TSD	*b.* Tosto TSD ..	773
TSE	*b.* Saphir	771
TSF	*b.* S. Mateo TSF ..	772
TSG	*b.* Augvald	764
TSH	*b.* Wilfred	773
TSI	*b.* Cederic	765
TSJ	*b.* Rowena TSJ ..	771
TSK	*b.* Vestheim	773
TSL	*b.* Rosegg	771
TSM	*b.* Margit Skogland ..	769
TSN	*b.* Ottar Jarl	770
TSO	*b.* Marie Nielson ..	769
TSP	*b.* Octo	770
TSQ	*b.* Snefjeld	771
TSR	*b.* Föina	766
TSR	*c.* Petrograd (Tsarskoe-Selo)	622
TSS	*b.* Viking TSS	773
TST	*b.* Modum	769
TSU	*b.* Fageraas	766
TSV	*b.* Kaggefos	768
TSW	*b.* Saugstad	771
TSX	*b.* Conrad Mohr ..	765
TSY	*b.* Bra-Kar	765
TSZ	*b.* Frederick Gilbert	766
TTA	*b.* Anna TTA	764
TTB	*b.* Haraldohaug ..	767
TTC	*b.* Aarstad	763
TTD	*b.* Ada TTD	763
TTE	*b.* Dageid	765
TTF	*b.* Hisko TTF ..	767
TTG	*b.* Grande Gaard ..	766
TTH	*b.* Kristianiafjord ..	768
TTI	*b.* Trondhjemsfjord ..	773
TTJ	*b.* Tanafjord	772
TTK	*b.* Frogner	766
TTL	*b.* Aagot	763
TTM	*b.* Renteria	770
TTN	*b.* Papelera	770
TTO	*b.* Oria	770
TTP	*b.* Navarra TTP ..	769
TTQ	*b.* Bogstad	765
TTR	*b.* Tatjana	772
TTS	*b.* Modesta	769
TTU	*b.* Skiensfjord ..	771
TTV	*b.* Bratsberg	765
TTW	*b.* Nepos	769
TTX	*b.* Lövland	769
TTY	*b.* Stokke	772
TTZ	*b.* Albatross TTZ ..	763
TUX	*b.* Kjellbergen ..	768
TVA	*b.* Andijk	715
TVB	*b.* Beukelsdijk ..	716
TVC	*b.* Maasdijk	721
TVD	*b.* Poeldijk	723
TVF	*b.* Zijldijk	728
TVG	*b.* Vechtdijk TVG ..	726
TVH	*b.* Kinderdijk TVH ..	720
TVI	*b.* Eemdijk	718
TVJ	*b.* Moerdijk TVJ ..	721
TVK	*b.* Stadsdijk	725
TVL	*b.* Maasdam	721
TVM	*b.* Leerdam	720
TVN	*b.* Spaarndam ..	725
TVO	*b.* **Amstelstroom** ..	715
TVP	*b.* **Berkelstroom** ..	716
TVQ	*b.* **Drechtstroom** ..	717
TVR	*b.* **Gouwestroom** ..	718
TVS	*b.* **Houtestroom** ..	719
TVT	*b.* **Jaarstroom**	719
TVU	*b.* **Kilstroom**	720
TVV	*b.* **Texelstroom** ..	725
TVW	*b.* **Waalstroom** ..	727
TVX	*b.* **Zaanstroom** ..	727
TVY	*b.* **Merwestroom** ..	721
TWA	*b.* **Saleier**	724
TWB	*b.* **Salabangka**	724
TWC	*b.* **Salawati**	724
TWD	*b.* **Simaloer**	725
TWE	*b.* **Saparoea**	724
TWF	*b.* **Sembilan**	724
TWG	*b.* **Madoera**	721
TWH	*b.* **Manoeran**	721
TWI	*b.* **Mapia**	721
TWJ	*b.* **Singkep**	725
TWK	*b.* Moena	721
TWL	*b.* **Soemba**	725
TWM	*b.* Enggano	718
TWQ	*b.* **Hermes TWQ** ..	719
TWR	*b.* **Haarlem**	719
TWS	*b.* **Hector**	719
TWT	*b.* **Brielle**	717
TWU	*b.* **Breda**	717
TWV	*b.* **Ares**	715

		PAGE
TWW	*b.* **Achilles**	715
TWX	*b.* **Adonis**	715
TWY	*b.* Agamemnon TWY	715
TWZ	*b.* Amor	715
TXA	*b.* Bacchus	715
TXB	*b.* Calypso TXB ..	717
TXC	*b.* Clio TXC	717
TXD	*b.* Hercules TXD ..	719
TXF	*b.* **Juno**	720
TXF	*b.* **Mercurius**	721
TXG	*b.* Minerva TXG ..	721
TXH	*b.* **Oberon**	722
TXI	*b.* Pollux	723
TXJ	*b.* **Saturnus**	724
TXK	*b.* **Stella**	725
TXM	*b.* Vesta TXM ..	727
TXN	*b.* Vulcanus TXN ..	727
TXO	*b.* Baarn	715
TXP	*b.* Helder	719
TXQ	*b.* Deucalion TXQ ..	717
TXR	*b.* Rhea	723
TXR	*b.* Nereus	722
TXS	*b.* Amsterdam TXS ..	715
TXS	*b.* Arnhem	715
TXT	*b.* Poseidon	723
TXU	*b.* Edam	718
TXV	*b.* Gaasterdijk	718
TXW	*b.* Grootendijk ..	718
TXX	*b.* Beemsterdijk ..	716
TXY	*b.* Breedijk	717
TXZ	*b.* Binnendijk	716
TYA	*b.* Elisabeth	718
TYB	*b.* Magdalena TYB ..	721
TYC	*b.* Cornelis	717
TYD	*b.* Phecda	723
TYE	*b.* Yselhaven	727
TYF	*b.* Keilehaven	720
TYG	*b.* Wassenaar	727
TYH	*b.* Sassenheim	724
TYI	*b.* Waalhaven ..	727
TYJ	*b.* Veerhaven	726
TYK	*b.* Jobshaven	719
TYL	*b.* Parkhaven	723
TYM	*b.* Hillegom	719
TYN	*b.* Naaldwijk	722
TYO	*b.* Vreewijk	727
TYP	*b.* Katwijk	720
TYT	*b.* Brabant TYI ..	717
TYU	*b.* Winsum	727
TYV	*b.* Wolsum	727
TYW	*b.* Hardenberg ..	719
TYX	*b.* Farmsum	718
TYY	*b.* Britsum	717
TYZ	*b.* Boomberg	717
TZA	*b.* Malang	721
TZB	*b.* Toba TZB	726
TZC	*b.* Mont Cenis TZC ..	721
TZD	*b.* Maristo	721
TZE	*b.* Noordzee	722
TZF	*b.* Yselveer	727
TZG	*b.* Maasdijk TZG ..	721
TZK	*b.* Beursplein	716
TZL	*b.* Westplein	727
TZM	*b.* Bloemfontein ..	716
TZM	*b.* **Dakar**	717
TZN	*b.* Nicolaas	722
TZO	*b.* Boschdijk	717
TZP	*b.* Burgerdijk	717
TZQ	*b.* Blijdendijk ..	716
TZR	*b.* Vecht	726
TZT	*b.* Blommersdijk ..	716
TZU	*b.* Bilderdijk	716
TZW	*b.* Alchiba	715
TZX	*b.* Alcor	715
TZY	*b.* Merak	721
TZZ	*b.* Albireo	715
UA	*c.* Nantes	593
US	*c.* **Swan Island** ..	628
UAE	*b.* Figuig UAE ..	693
UBD	*b.* S. Camille	703
UBS	*b.* **Arriluze**	685
UCJ	*c.* Santa Marta ..	584
UCR	*b.* Min UCR	698
UCT	*b.* Catinat	689
UCU	*b.* Gatinais	693
UDI	*b.* Macoris UDI ..	697
UDR	*b.* Doris UDR ..	691
UDU	*b.* La Bourdonnais ..	686
UFF	*b.* Mont Kemmel ..	698
UFQ	*c.* Sainte Assise ..	593
UGB	*b.* S. Carlo	703
UGN	*b.* S. Marco	703
UGQ	*b.* Psyche	701
UGR	*b.* Phyrne	700
UGS	*b.* Stilbe	703
UHB	*b.* Orient UHB ..	699
UHC	*b.* Alycon	684
UHF	*b.* La Champagne ..	689
UHH	*b.* Albert Gallus ..	683
UHI	*b.* Helengallus	694
UHM	*b.* Ouragan	699
UHO	*b.* Tenax	704
UHP	*b.* Typhon	705
UHR	*b.* PLM 7	700
UHS	*b.* PLM 8	700
UHT	*b.* PLM 10	700
UHV	*b.* Cap Lopez	689
UKA	*b.* Jeanne Marie ..	695
UKB	*b.* Marguerite UKB ..	697
UKC	*b.* Wagram	707
UKD	*b.* Friedland	693
UKE	*b.* Aimee	683
UKF	*b.* Halicor	694
UKG	*b.* Graziella	694
UKH	*b.* Genevieve	693
UKI	*b.* Cecile	689
UKJ	*b.* Coucy UKJ ..	690
UKK	*b.* Singe	703
UKL	*b.* Ambroise Pare ..	684
UKM	*b.* La Mouette ..	696
UKO	*b.* Alexandrine ..	683
UKP	*b.* Jubarte	695
UKS	*b.* Cite de Verdun ..	690
UKT	*b.* Loki UKT ..	696
UKU	*b.* Avant-Garde ..	685
UKV	*b.* Liberté	696
UKW	*b.* Nora Hugo Stinnes II	699
UMA	*b.* Albi	683
UMB	*b.* Montauban	698
UMD	*b.* Janine	695
UNK	*c* Herzegnovi	608
VB	*b.* Tegucigalpa ..	728
VY	*b.* Yoro	728
VAA	*c.* Halifax Dockyard	579
VAB	*c.* Point Grey ..	580
VAC	*c.* Cape Lazo	578
VAD	*c.* Pachena	580

		PAGE
VAE	*c.* Estevan, British Columbia	578
VAF	*c.* Alert Bay	577
VAG	*c.* Bull Harbour, B.C.	577
VAG	*c.* Triangle Island	581
VAH	*c.* Dead Tree Point	578
VAI	*c.* Ikeda Head	579
VAJ	*c.* Digby Island	578
VAK	*c.* Gonzales Hill	579
VAL	*c* Barrington Passage	577
VAM	*b.* Iperia	671
VAN	*c.* Newcastle	580
VAP	*b.* Mina Brea	671
VAR	*c.* St. John N.B.	581
VAU	*b.* Schoolcraft	673
VAV	*c.* Chebucto Head D.F.	578
VAW	*c.* High River	579
VAX	*c.* Canso DF	578
VAZ	*c.* Cape Race DF	578
VBA	*c.* Port Arthur, Ontario	580
VBB	*c.* Sault Ste. Marie, Ontario	580
VBC	*c.* Midland, Ontario	579
VBD	*c.* Tobermory, Ontario	581
VBE	*c.* Point Edward	580
VBF	*c.* Port Burwell	580
VBG	*c.* Toronto	581
VBH	*c.* Kingston, Ontario	579
VBI	*b.* Riverton	672
VBJ	*b.* Glenlyon	670
VBL	*b.* Glenfinnan	670
VBM	*c.* Le Pas, Manitoba	579
VBN	*c.* Port Nelson, Manitoba	580
VBP	*b.* Saguenay	672
VBQ	*b.* Royalite	672
VBR	*b* Sarnolite	673
VBS	*b.* Icolite	671
VBU	*b.* Stadacona VBU	673
VBV	*b.* Hochelaga VBV	671
VBZ	*b.* Gulnare	671
VCA	*c.* Montreal	579
VCB	*c.* Three Rivers, Quebec	581
VCC	*c.* Quebec	580
VCD	*c.* Gross Isle, Quebec	579
VCE	*c.* Cape Race	578
VCF	*c.* Father Point	579
VCG	*c.* Fame Point	579
VCH	*c.* Point Riche	580
VCI	*c.* Heath Point	579
VCJ	*c.* Harrington, Quebec	579
VCK	*c.* Clarke City	578
VCL	*c.* Point Amour	580
VCM	*c.* Belle Isle	577
VCN	*c.* Grindstone Island	579
VCO	*c.* North Sydney, Nova Scotia	580
VCP	*c.* Cape Bear	578
VCQ	*c.* Pictou, Nova Scotia	580
VCR	*c.* Cape Ray	578
VCS	*c.* Camperdown, Nova Scotia	578
VCT	*c.* Sable Island	580
VCU	*c.* Cape Sable	578
VCV	*c.* Partridge Island	580
VCW	*b.* Montreal	671
VCY	*b.* Harold Dollar	671

		PAGE
VDA	*b.* Niobe VDA	672
VDB	*b.* Rainbow VDB	672
VDC	*b.* Canada VDC	668
VDE	*b.* Stanley	673
VDF	*b.* Lady Laurier	671
VDG	*b.* Aberdeen VDG	668
VDH	*b.* Druid	670
VDJ	*b.* Montcalm VDJ	671
VDK	*b.* Tyrian VDK	673
VDL	*b.* Lady Grey	671
VDN	*b.* Estevan	670
VDO	*b.* Dollard	670
VDP	*b.* Newington	671
VDQ	*b.* Aranmore	668
VDR	*c.* Lurcher Lightship	579
VDS	*b.* Bellechasse	668
VDT	*b.* Acadia	668
VDU	*b.* Malaspina	671
VDW	*b.* Margaret VDW	671
VDX	*b.* Lady Evelyn	671
VDZ	*b.* Sheba	673
VEA	*b.* Dalhousie City	670
VEB	*b.* Corona VEB	670
VEC	*b.* Kingston	671
VED	*b.* Toronto VED	673
VEE	*b.* Melville Dollar	671
VEF	*b.* Cape Trinity	669
VEG	*b.* Rapids King	672
VEH	*b.* Chippewa	670
VEK	*b.* Macassa	671
VEL	*b.* Cayuga VEL	670
VEP	*b.* Empire	670
VER	*b.* Ontario No. 2	672
VET	*b.* G. R. Crowe	670
VEW	*b.* Glenshee	670
VEX	*b.* Charlton	670
VEY	*b.* Reginald	672
VFA	*b.* Princess Adelaide	672
VFB	*b.* Princess Mary	672
VFC	*b.* Princess Beatrice	672
VFD	*b.* Princess Alice	672
VFE	*b.* Princess Charlotte	672
VFG	*b.* Princess Royal VFG	672
VFH	*b.* Princess May	672
VFJ	*b.* Princess Ena VFJ	672
VFK	*b.* Tees	673
VFL	*b.* Prince Albert	672
VFM	*b.* Prince John	672
VFO	*b.* Bessie Dollar	668
VFQ	*b.* Alberta VFQ	668
VFX	*b.* Lord Strathcona VFX	671
VFY	*b.* Harrison	671
VFZ	*b.* Camosun	668
VGC	*b.* Keewatin	671
VGD	*b.* Hamonic	671
VGE	*b.* Huronic	671
VGG	*b.* Athabasca	668
VGH	*b.* Manitoba	671
VGI	*b.* Assiniboia	668
VGJ	*b.* Prince Arthur	672
VGK	*b.* Prince George VGK	672
VGM	*b.* Imperoyal	671
VGN	*b.* Chelohsin	670
VGT	*b.* Princess Maquinna	672
VGU	*b.* Ontario No. 1	672
VGW	*b.* Noronic	672
VGX	*b.* Venture	673

		PAGE
VGZ	*b.* Princess Patricia ..	672
VHB	*b.* Levuka	659
VHD	*b.* Kanowna	659
VHE	*b.* Karoola	659
VHF	*b.* Bombala	658
VHG	*b.* Emita	659
VHI	*b.* Wandilla	661
VHK	*b.* Wodonga	661
VHL	*b.* Dimboola	659
VHM	*b.* Kangaroo	659
VHN	*b.* Katoomba	659
VHO	*b.* Canberra	659
VHQ	*b.* Fiona	659
VHR	*c.* Maron	602
VHS	*b.* Lady Loch ..	659
VHT	*b.* Montoro	660
VHU	*b.* Mataram VHU ..	660
VHW	*b.* Wyandra ..	661
VHX	*b.* Victoria VHX ..	661
VHY	*b.* Ulimaroa	660
VIA	*c.* Adelaide Radio ..	567
VIB	*c.* Brisbane Radio ..	567
VIC	*c.* Cooktown Radio	567
VID	*c.* Darwin Radio ..	567
VIE	*c.* Esperance Radio ..	567
VIF	*c.* Woodlark Island ..	568
VIG	*c.* Port Moresby Radio	613
VIH	*c.* Hobart Radio ..	567
VII	*c.* Thursday Island Radio	568
VIJ	*c.* Samarai Radio ..	613
VIL	*c.* Flinders Island Radio ..	567
VIM	*c.* Melbourne Radio ..	567
VIN	*c.* Geraldton Radio ..	567
VIO	*c.* Broome Radio ..	567
VIP	*c.* Perth Radio ..	567
VIQ	*c.* Macquarie Island Radio	567
VIR	*c.* Rockhampton Radio	567
VIS	*c.* Sydney Radio ..	568
VIT	*c.* Townsville Radio ..	568
VIU	*c.* Kieta	625
VIV	*c.* Madang Radio ..	613
VIW	*c.* Wyndham Radio ..	568
VJA	*b.* Riverina	660
VJB	*b.* Westralia	661
VJC	*b.* Zealandia	661
VJD	*b.* Bingera	658
VJE	*b.* Cooma	659
VJF	*b.* Morinda	660
VJG	*b.* Wyreema	661
VJH	*b.* Loongana ..	659
VJI	*b.* Suva	660
VJJ	*b.* Aramac	658
VJK	*b.* Gilgai	659
VJM	*b.* Charon	659
VJP	*b.* Bulla	658
VJQ	*b.* Boonah	658
VJR	*b.* Barambah	658
VJS	*b.* Bakara	658
VJT	*b.* Boorara	658
VJU	*b.* Hwah Ping ..	659
VJV	*b.* Araluen	658
VJW	*b.* Dongarra	659
VJY	*b.* Mindini	660
VJZ	*c.* Rabaul Radio ..	613
VKI	*b.* Warra VKI ..	661
VKN	*b.* Navy Office ..	660

		PAGE
VKO	*b.* Cerebus	659
VKP	*b.* Flinders Island base	659
VKQ	*b.* Garden Island base	659
VKR	*b.* Cockburn Sound base	659
VKS	*b.* Port Stephens base	660
VKT	*c.* Nauru	609
VKU	*b.* Parattah	660
VKV	*b.* Arawatta	658
VKW	*b.* Gorgan VKW ..	659
VKX	*b.* Minderoo	660
VKY	*b.* Marsina	660
VLA	*c.* Awanui Radio ..	614
VLB	*c.* Awarua Radio ..	614
VLC	*c.* Chatham Islands ..	614
VLD	*c.* Auckland Radio ..	614
VLH	*b.* Kaipoi	763
VLI	*b.* Kaitangata ..	763
VLQ	*b.* Kanna	763
VLS	*b.* Mapourika	763
VLT	*b.* Kaituna	763
VLW	*c.* Wellington Radio ..	614
VLX	*b.* Tutanekai	763
VLY	*b.* Paloona	763
VMA	*b.* Arahura	763
VMB	*b.* Karori	763
VMC	*b.* Kauri	763
VMD	*b.* Koromiko	763
VME	*b.* Rakanoa	763
VMF	*b.* Tarawera	763
VMG	*c.* Apia Radio	623
VMH	*b.* Terawhiti	763
VMJ	*b.* Waitomo	891
VML	*b.* Whangape	763
VMM	*b.* Monowai	763
VMN	*b.* Katoa	763
VMO	*b.* Waipori	763
VMP	*b.* Wanaka	763
VMR	*c.* Rarotonga	584
VMX	*b.* Rotomahana ..	763
VMZ	*b.* Mararoa	763
VNA	*b.* Ludwig Wiener ..	781
VNC	*c.* Capetown	625
VND	*c.* Durban	626
VNF	*c.* Dassen Island ..	625
VNH	*b.* Sir David Hunter..	781
VNL	*b.* Africshore	802
VNS	*b.* South Africa ..	781
VNQ	*c.* Port Elizabeth Radio	626
VOA	*c.* Battle Harbour ..	577
VOB	*c.* Venison Island ..	581
VOC	*c.* American Tickle ..	577
VOD	*c.* Domino	578
VOE	*c.* Grady, Labrador ..	579
VOF	*c.* Smokey Tickle ..	581
VOG	*c.* Holton, Labrador ..	579
VOH	*c.* Cape Harrison ..	578
VOI	*c.* Makkovik	579
VOJ	*c.* Fogo	579
VOK	*b.* Ranger	763
VOL	*b.* Glencoe	762
VOM	*b.* Prospero	763
VON	*b.* Portia	763
VOQ	*b.* Diana	762
VOR	*b.* Kyle	762
VOU	*b.* Eagle VOU	762
VOX	*b.* Neptune VOX ..	763
VPB	*c.* Colombo Radio ..	581
VPD	*c.* Suva	591
VPE	*c.* Labasa	591

		PAGE
VPF	*c.* Taveuni	591
VPG	*c.* Accra	600
VPI	*c.* Aden Radio VPI	558
VPJ	*c.* Berbera Radio	576
VPK	*c.* Cocos	583
VPL	*c.* Trinidad	577
VPM	*c.* Tobago	577
VPN	*c.* Nassau, Bahamas	569
VPO	*c.* Barbados	576
VPP	*c.* Belize	575
VPQ	*c.* Mombassa	574
VPS	*c.* Cape D'Aguilar	602
VPT	*c.* Malta Island	609
VPU	*c.* Sierra Leone	625
VPW	*c.* Singapore Radio	609
VPX	*c.* Penang Radio	609
VPY	*c.* Lagos	615
VPZ	*c.* Zanzibar	654
VQA	*c.* Jessleton	574
VQB	*c.* Sandakan	574
VQC	*c.* Tawao	574
VQD	*c.* Kudat	574
VQE	*c.* Pemba, Zanzibar	654
VQF	*c.* Kuching	624
VQG	*c.* Toco, Trinidad	577
VQH	*c.* S. Lucia	577
VQI	*c.* Kingston, Jamaica	577
VQJ	*c.* Tulagi	625
VQK	*c.* Ocean Island	599
VQL	*c.* Savu Savu	591
VQN	*c.* Fanning Island	590
VQO	*c.* Washington Island	654
VQP	*c.* Miri	624
VQQ	*c.* Kismayu	574
VQR	*c.* Serenli	574
VQS	*c.* San Kuri	574
VQT	*c.* Wajheir	574
VQU	*c.* Moyale	574
VQV	*c.* Sibu	624
VQW	*c.* Sadung	624
VQX	*c.* Burao	576
VQY	*c.* Las Dureh	576
VQZ	*c.* Fox Bay	590
VRE	*b.* Nile VRE	728
VRH	*b.* Energie	661
VRI	*b.* Parisian	668
VRJ	*b.* Powerful	663
VRK	*b.* Labourdonnais	761
VRL	*b.* Pioneer VRL	683
VRM	*b.* Gibel Sarsar	711
VRN	*b.* Rescue VRN	711
VSA	*c.* Hargeisa	576
VSB	*c.* Nukualofa Radio	630
VSD	*c.* Goebilt	624
VSE	*c.* Governors Harbour, Eleuthera Island	569
VTB	*c.* Bushire	617
VTC	*c.* Basrah	617
VTD	*c.* Diamond Island	575
VTE	*c.* Bahrein	617
VTH	*c.* Henjam	617
VTL	*c.* Lingah	617
VTP	*c.* Port Blair	575
VTR	*c.* Rangoon Radio	575
VTT	*c.* Table Island	575
VTV	*c.* Victoria Point	576
VUA	*b.* Nearchus	729
VUB	*b.* Dufferin	729
VUC	*b.* Hardinge	729
VUD	*b.* Northbrook	729
VUE	*b.* Arratoon Apcar	729
VUF	*b.* Katherine Apcar	729
VUG	*b.* Japan	729
VUH	*b.* Hindu	843
VUJ	*b.* Homayun	729
VUK	*b.* Naderi	729
VUK	*b.* Noderi	729
VUL	*b.* Lightning	728
VUM	*b.* Minto	729
VUP	*b.* Patrick Stewart	729
VUQ	*b.* Dara	729
VUR	*b.* Gregory Apcar	729
VUS	*b.* Shuja	729
VUT	*b.* Investigator	729
VUV	*b.* Clive	729
VUW	*b.* Lawrence VUW	729
VUX	*b.* Dalhousie	729
VUY	*b.* Franz Ferdinand	729
VUZ	*b.* Kara Deniz	729
VWB	*c.* Bombay Radio	575
VWC	*c.* Calcutta Radio	575
VWK	*c.* Karachi Radio	575
VWM	*c.* Madras Radio	575
VWS	*c.* Sandheads	729
VXA	*b.* Oonah	660
VXB	*b.* Bambra	658
VXC	*b.* Berringa	658
VXC	*b.* Cethana	659
VXD	*b.* Talawa	660
VXE	*b.* Dilga	659
VXF	*b.* Culburra	659
VXF	*b.* Bethanga	658
VXG	*b.* Enoggera	659
VXG	*b.* Chalamba	659
VXJ	*b.* Coolcha	659
VXL	*b.* Shandon VXL	660
VXM	*b.* Bundarra	658
VXN	*b.* Ooma	660
VXP	*b.* Dromana	659
VXQ	*b.* Rona	660
VXT	*b.* Delungra	659
VXU	*b.* Dinoga	659
VXV	*b.* Dumosa	659
VXW	*b.* Dundula	659
VXX	*b.* Mackarra	659
VXY	*b.* Macumba	659
VYB	*b.* Terra Nova	763
VYC	*b.* Viking	763
VYD	*b.* Sagona	763
VYE	*b.* Seal VYE	763
VYT	*b.* Meigle	763
VYW	*b.* Thetis	763
VZB	*b.* Makambo	659
VZE	*c.* King Island	567
VZG	*b.* Governor Musgrave	659
VZH	*b.* Karuah	659
VZK	*c.* Morobe Radio	613
VZM	*b.* Carina	659
VZN	*b.* Yankalilla	661
VZO	*c.* Manus Radio	558
VZP	*b.* Australpool	658
VZQ	*b.* Australcrag	658
VZR	*c.* Kawieng	614
VZS	*b.* Australpeak	658
VZT	*b.* Australport	658
VZU	*b.* Australfield	658
VZV	*b.* Calulu	658
VZW	*b.* Australmead	658

		PAGE
VZX	*c.* Eitape Radio ..	613
VZY	*b.* Australmount ..	658
VGBC	*b.* Canadian Traveller	669
VGBD	*b.* City of Vancouver..	670
VGBF	*b.* Canadian Mariner..	669
VGBJ	*b.* Paipoonge	672
VGBK	*b.* Canadian Sapper ..	669
VGBL	*b.* Alphonse Racine ..	668
VGBM	*b.* Canadian Fisher ..	669
VGBP	*b.* Canadian Victor ..	669
VGBS	*b.* Julius Kessler ..	671
VGBX	*b.* Canadian Hunter ..	669
VGCD	*b.* Margaret Coughlan	671
VGCK	*b.* Kiora	671
VGCP	*b.* Saskatoon	673
VGCS	*b.* Volunda	673
VGDB	*b.* Canadian Winner..	669
VGDC	*b.* Canadian Highlander	669
VGDJ	*b.* Mapledean	671
VGDL	*b.* Northumberland VGDL	672
VGDX	*b.* Mapledawn.. ..	671
VGDT	*b.* Canadian Runner ..	669
VGDZ	*b.* Canadian Rover ..	669
VGFB	*b.* Maplecourt.. ..	671
VGFS	*b.* Eunice B	670
VGFW	*b.* Ormes	672
VGJC	*b.* Sarnian	672
VGJR	*b.* L. J. Skinner ..	671
VGJT	*b.* Canadian Squatter	669
VGKJ	*b.* Reliance	672
VGKM	*b.* Canadian Carrier ..	669
VGLB	*b.* Canadian Observer	669
VGLF	*b.* Canadian Otter ..	669
VGLP	*b.* Aleli..	668
VGLR	*b.* Lord Ormonde ..	671
VGLX	*b.* Canadian Conqueror	669
VGNC	*b.* Canadian Trapper..	669
VGNP	*b.* Eva R	670
VGNT	*b.* City of Victoria ..	670
VWBM	*b.* Ahmedi	729
VWBG	*b.* Hejaz	729
VWBK	*b.* Koweit	729
VWBJ	*b.* Jeddah	729
VWBL	*b.* Loyalty	729
VWBS	*b.* Shushtar	729
WI	*c.* Munster Ruhr ..	598
WH	*c.* Frankfort-on-Maine	598
WAA	*b.* Alameda WAA ..	897
WAB	*b.* Saugerties	984
WAC	*b.* Chicago WAC ..	913
WAD	*b.* Victoria WAD ..	1007
WAE	*b.* Ketchikan	946
WAF	*b.* Admiral Farragut	896
WAG	*b.* Admiral Sebree ..	897
WAH	*b.* Dora WAH ..	923
WAI	*b.* Latouche	955
WAJ	*b.* Jefferson WAJ ..	943
WAK	*b.* Valdez	1007
WAL	*b.* S. Ana WAL ..	1001
WAM	*b.* Juneau	944
WAN	*b.* Northwestern WAN	968
WAO	*b.* Rajah WAO ..	978
WAP	*b.* Lake Crescent ..	949
WAQ	*b.* Democracy.. ..	922
WAR	*c.* Warsaw	610
WAR	*b.* Cordova	918
WAS	*b.* Chester Sun ..	913
WAT	*b.* Skagway	987
WAU	*b.* Point Loma ..	975
WAV	*b.* Philippines	974
WAW	*b.* Admiral Watson ..	897
WAX	*b.* Admiral Schley ..	897
WAX	*b.* Bella	904
WAY	*b.* Admiral Dewey ..	896
WBA	*b.* S. Clara	1001
WBB	*b.* S. Cecilia	1001
WBC	*c.* East Moriches ..	640
WBD	*b.* S. Cruz WBD ..	1001
WBE	*b.* Cacique	909
WBF	*c.* Boston WBF ..	637
WBG	*b.* Astmahco III ..	901
WBG	*b.* Venezuela WBG ..	1007
WBJ	*b.* S. Barbars	1001
WBK	*b.* Saucon	984
WBN	*b.* Ecuador	927
WBO	*b.* S. Rosa	1002
WBP	*b.* Hermosa	939
WBQ	*b.* S. Paula	1002
WBR	*b.* S. Rita WBR ..	1002
WBT	*c.* Binghamton ..	637
WBU	*c.* Hoboken, New Jersey	643
WBV	*b.* Cabrillo	909
WBW	*c.* Burwood WBW ..	637
WBX	*b.* S. Ana WBX ..	1001
WCA	*b.* Tionesta	1004
WCB	*b.* Juniata WCB ..	944
WCC	*c.* Chatham, Massachusetts WCC ..	639
WCD	*b.* Octorara WCD ..	969
WCE	*b.* Parthian	972
WCF	*b.* Favorite WCF ..	930
WCG	*c.* Brooklyn WCG ..	637
WCI	*c.* Newport WCI ..	648
WCL	*b.* Westchester ..	1010
WCO	*b.* Wyandotte WCO ..	1016
WCP	*b.* Casco	911
WCR	*b.* Harvester (The) ..	938
WCS	*b.* Alpena	899
WCT	*b.* Theodore Roosevelt WCT .	1004
WCU	*b.* Conneaut	917
WCW	*b.* Woonsocket ..	1016
WCX	*c.* Cleveland WCX ..	639
WCX	*b.* Levi G. Burgess ..	955
WCY	*c.* Cape May WCY ..	638
WCZ	*b.* Illinois WCZ ..	941
WDA	*b.* Pere Marquette ..	974
WDB	*b.* Pere Marquette 19	974
WDC	*b.* Pere Marquette 17	974
WDD	*b.* Pere Marquette 18	974
WDE	*b.* Pere Marquette 20..	974
WDF	*b.* Astmahco IV ..	901
WDG	*b.* Otsego	971
WDH	*b.* Petoskey	974
WDI	*b.* City of Miami ..	915
WDL	*b.* Lakeland WDL ..	953
WDN	*b.* Ann Arbor No. 3 ..	899
WDO	*b.* Ann Arbor No. 4 ..	900
WDP	*b.* Ann Arbor No. 5 ..	900
WDQ	*b.* Ann Arbor No. 6 ..	900
WDR	*c.* Detroit WDR ..	639
WDS	*b.* City of Grand Rapids	914
WDU	*b.* Puritan WDU ..	976
WDV	*b.* City of Benton Harbor	914
WDX	*b.* Lake Tulare ..	954

		PAGE
WKS	*b.* West Arroe	1009
WKT	*b.* Texan	1003
WKU	*b.* Hawaiian	938
WKV	*b.* Virginian WKV ..	1007
WKW	*b.* Absaroka	896
WKX	*b.* Westward Ho ..	1013
WKZ	*b.* Canoga	909
WLA	*b.* Benj. F. Panchard	905
WLB	*b.* Jamaica	943
WLC	*c.* New London ..	648
WLE	*b.* Maitland No. 1 ..	958
WLF	*b.* Coosa	918
WLG	*b.* Yucatan	1017
WLH	*b.* Fort Bragg ..	931
WLI	*b.* Westbrook	1009
WLJ	*b.* Monticello	963
WLL	*b.* Greenwood	935
WLM	*b.* Warszawa WLM ..	1009
WLN	*b.* Black Arrow ..	905
WLO	*b.* Orion	971
WLQ	*b.* Sabine Sun ..	983
WLR	*b.* Floridian	931
WLS	*b.* Princess Matoika ..	976
WLT	*b.* Neuse	967
WLU	*b.* Pawnee WLU ..	973
WLV	*b.* Ida WLV	941
WLX	*b.* Pequot	974
WLY	*b.* Poznam	975
WMA	*b.* Multnomah.. ..	964
WMD	*b.* West Shore.. ..	1013
WMF	*b.* Celilo	911
WMG	*b.* Wapama	1008
WMI	*b.* Minnesota WMI ..	962
WMJ	*b.* Ernest H. Meyer ..	929
WMK	*b.* Hyades	941
WML	*b.* Lurline	957
WMM	*b.* Freeman	932
WMN	*b.* Enterpris	929
WMO	*b.* Wilhelmina.. ..	1014
WMP	*b.* Matsonia	959
WMQ	*b.* Manoa	958
WMS	*b.* Wahkeena	1008
WMT	*b.* Point Bonita ..	975
WMV	*b.* Kermit	946
WMY	*b.* A. M. Byers ..	899
WMZ	*b.* Honolulu	940
WNB	*b.* Captain WNB (El)	910
WNC	*b.* Wabash	1007
WND	*b.* Windber	1015
WNE	*b.* Nushagak	968
WNF	*b.* Hattie Luckenbach	938
WNG	*b.* Otto M. Reiss ..	971
WNH	*b.* Clemens A. Reiss	915
WNI	*b.* William A. Reiss	1014
WNK	*b.* Richard J. Reiss ..	979
WNL	*b.* Lake St. Clair ..	954
WNM	*b.* Florence Luckenbach	931
WNN	*c.* Belfast, Maine ..	637
WNP	*b.* Pleiades	975
WNQ	*b.* Frederic Ewing ..	932
WNR	*b.* Rush	981
WNS	*b.* Kvichak	947
WNU	*c.* New Orleans WNU	648
WNV	*b.* Hatteras	938
WNW	*b.* S. Ramon	1002
WNX	*b.* Peter Reiss ..	974
WNY	*c.* New Brunswick, New Jersey WNY	648
WNY	*b.* John F. Reiss ..	944
WNY	*c.* New York WNY ..	648
WNZ	*b.* F. J. Luckenbach	931
WOA	*b.* Admiral Rodman ..	896
WOD	*c.* Beaumont, Texas..	637
WOF	*b.* Horace X. Baxter	940
WOG	*b.* Fred Baxter ..	932
WOI	*c.* Akron, Ohio ..	636
WOJ	*b.* Iris WOJ	942
WOK	*c.* Detroit, Michigan WOK	639
WOL	*b.* Angeles (Los) ..	899
WOM	*b.* William A. Mc. Kenney	1014
WON	*b.* Brea (La)	907
WOP	*b.* Lake Elizabeth ..	949
WOT	*b.* Coalinga	915
WOU	*b.* Oregon WOU ..	970
WOV	*b.* Venetia WOV ..	1007
WOW	*b.* Henry J. Biddle ..	939
WOY	*b.* Queen II	976
WPB	*b.* Northbend	968
WPC	*b.* Tyee WPC.. ..	1006
WPE	*b.* Tatoosh	1003
WPF	*c.* Providence, R.I. .	650
WPH	*b.* S. M. Fischer ..	987
WPI	*b.* Independent ..	941
WPJ	*b.* Mount Summit ..	964
WPK	*b.* Florence Olson ..	931
WPL	*b.* Seafarer	985
WPN	*b.* Pioneer WPN ..	972
WPO	*c.* Carney's Point ..	638
WPP	*c.* Wilmington, Delaware	653
WPQ	*b.* Zapora	1017
WPR	*c.* Ensenada	620
WPS	*b.* Starr	990
WPT	*c.* Wells, Minnesota ..	653
WPU	*c.* New Prague ..	648
WPV	*b.* H. M. Whitney ..	939
WPW	*b.* James S. Whitmey	943
WPX	*b.* Oneonta	970
WPY	*b.* Wallula	1008
WQC	*b.* Fayette Brown ..	930
WQD	*b.* Hisko	939
WQE	*b.* Harvey H. Brown..	938
WQF	*b.* Harry W. Croft ..	957
WQH	*b.* M. A. Bradley ..	957
WQI	*b.* Costa Rica ..	918
WQJ	*b.* Sarah Weems ..	984
WQL	*c.* Independence, Kansas	643
WQM	*c.* Wichita, Kansas ..	653
WQQ	*b.* Rappahannock ..	978
WQR	*b.* Nansemond ..	965
WQS	*b.* Artemis WQS ..	901
WQT	*b.* Watauga	1009
WQU	*b.* Cuba WQU ..	920
WQV	*c.* Mount Vernon, Ohio	648
WQW	*b.* Jeannette Skinner..	943
WQZ	*b.* West Eagle ..	1010
WRA	*b.* O. A. Hermanson ..	969
WRB	*b.* Berlin	905
WRC	*b.* Silverado	986
WRD	*b.* D. G. Scofield ..	923
WRE	*b.* J. A. Moffett ..	943
WRF	*b.* Amelia	899
WRG	*b.* Annetta	900
WRI	*b.* Paraiso	772
WRJ	*b.* Admiral Goodrich ..	896
WRN	*b.* Siboney	986

		PAGE
WRO	*b.* Middlesex	961
WRS	*b.* Suffolk WRS ..	999
WRV	*b.* Alliance	899
WRX	*b.* Ozama	971
WRZ	*b.* Rainier	978
WSA	*c.* East Hampton ..	640
WSC	*b.* Siasconset WSC ..	651
WSD	*b.* Redwood	979
WSE	*c.* New York	648
WSF	*b.* Admiral Wainwright	897
WSG	*b.* Norwood	968
WSI	*b* S. Inex	1001
WSJ	*b.* S. Alicia	1001
WSK	*c.* New York WSK ..	649
WSM	*b.* Fair Oaks	929
WSO	*c.* Chatham WSO ..	639
WSO	*c.* Marion WSO ..	647
WSP	*b.* Westhampton ..	1011
WSQ	*b.* Vizcaya	1007
WSR	*b.* Reuce	979
WSS	*b.* S. Nicholas ..	1002
WST	*c.* Rockland, Maine ..	650
WSU	*b.* Republic	979
WSW	*b.* Willamette	1014
WSZ	*b.* Bremerton	907
WTC	*b.* Lansing	955
WTD	*b.* Oleum	970
WTF	*b.* Westwood	1013
WTG	*b.* S. Rita WTG ..	1002
WTH	*b.* West Lake ..	1012
WTJ	*b.* Sutherland WTJ ..	1000
WTL	*b.* Lyman Stewart ..	957
WTM	*b.* W. S. Porter ..	1016
WTN	*b.* Wm. F. Herrin ..	1015
WTO	*b.* Frank H. Buck ..	931
WTP	*c.* Scranton, Pennsylvania	651
WTQ	*b.* Segundo (El) ..	985
WTR	*b.* Richmond	979
WTS	*b.* Col. E. L. Drake ..	916
WTT	*b.* Atlas	902
WTU	*b.* S. O. Co. No. 91 ..	987
WTV	*b.* Captain A. F. Lucas	910
WTV	*b.* Tamesi	1003
WTW	*b.* Ossineke	971
WTX	*b.* Asuncion	901
WTY	*b.* S. O. Co. No. 93 ..	987
WTZ	*b.* S. O. Co. No. 95 ..	987
WUA	*c.* Fort Andrews ..	641
WUB	*c.* Fort Hancock, New Jersey	641
WUC	*c.* Fort H. G. Wright	641
WUD	*c.* Fort Leavenworth	641
WUE	*c.* Fort Levett ..	641
WUF	*c.* Fort Monroe ..	641
WUG	*c.* Camp Marfa, Kentucky	638
WUH	*c.* Fort McIntosh ..	641
WUI	*c.* Fort Riley ..	642
WUJ	*c.* Fort Sam Houston	642
WUK	*c.* Fort Stevens ..	642
WUL	*c.* Fort Totten ..	642
WUM	*c.* Fort Wood ..	643
WUN	*c.* Fort Worden ..	643
WUO	*c.* Fort Winfield Scott	642
WUQ	*c.* Washington WUQ	653
WUR	*c.* Fort Morgan, Alabama WUR ..	641
WUS	*c.* Fort Rosecrans ..	642
WUT	*c.* Fort Caswell ..	641
WUU	*c.* Fort Adams ..	641
WUV	*c.* Livengood, Alaska	561
WUX	*c.* Fort Crockett ..	641
WUY	*c.* Fort San Jacinto ..	642
WUZ	*c.* Brownsville, Texas	637
WUZ	*c.* Fort Brown, Texas ..	641
WVA	*c.* Circle City	559
WVB	*c.* Fairbanks, Alaska	559
WVC	*c.* Fort Egbert ..	559
WVD	*c.* Fort Gibbon, Alaska	559
WVE	*c.* St. Michael	562
WVE'	*c.* Fort St. Michael ..	560
WVF	*c.* Kotlik	561
WVG	*c.* Nome, Alaska ..	561
WVH	*c.* Nulato	561
WVI	*c.* Petersburg, Alaska	561
WVJ	*c.* Wrangell	563
WVK	*c.* Holy Cross, Alaska	560
WVL	*c.* Fort Frank	618
WVN	*c.* Fort Mills WVN ..	618
WVO	*c.* Davao	618
WVP	*c.* Fort Drum ..	618
WVR	*c.* Fort Wint	619
WVS	*c.* Jolo	619
WVT	*c.* Malabang	619
WVU	*c.* Manila	619
WVV	*c.* Puerto Princesa ..	619
WVW	*c.* Zamboanga ..	619
WVX	*c.* Cuyo	618
WVY	*c.* S. José, Mindoro ..	619
WVZ	*c.* Fort Mills WVZ ..	619
WWA	*b.* China WWA ..	913
WWC	*b.* Western Wave ..	1011
WWD	*b.* Arcadia	900
WWE	*b.* Manchuris	958
WWF	*b.* City of Para ..	915
WWH	*b.* Newport WWH ..	967
WWK	*b.* Western Queen ..	1011
WWL	*b.* S. Jose WWL ..	1001
WWM	*b.* S. Juan WWM ..	1002
WWN	*b.* Mongolia	963
WWP	*b.* Ausable	902
WWQ	*c.* Bellefonte	637
WWR	*c.* Wau	628
WWR	*b.* Rose City	980
WWS	*b.* Alaska WWS ..	898
WWU	*c.* Newark, New Jersey WWU	648
WWV	*c.* Washington WWV	653
WWY	*b.* Slocum	987
WXA	*b.* Buford WXA ..	908
WXB	*b.* Crook	920
WXC	*b.* Dix	923
WXD	*b.* Kilpatrick	940
WXI	*b.* Merritt	961
WXJ	*b.* Sheridan WXJ ..	986
WXK	*b.* Sherman WXK ..	986
WXL	*c.* Iditarod	560
WXM	*b.* Thomas WXM ..	1004
WXN	*b.* Warren	1008
WXO	*c.* Craig	559
WXP	*c.* Fort Travis ..	642
WXQ	*c.* Fort St. Philip ..	642
WXR	*b.* Burnside WXR ..	908
WXS	*b.* Cyrus W. Field ..	921
WXT	*b.* Joseph Henry ..	944
WXU	*b.* Navesink	906
WXV	*c.* McGrath, Alaska ..	561

		PAGE
WXW	*b.* General John M. Schofield ..	933
WXX	*c.* Fort Yukon, Alaska	560
WXZ	*c.* Fort Story	642
WYA	*b.* General Royal T. Frank	933
WYB	*b.* General S. N. Mills	934
WYC	*b.* Major Samuel Ringgold	958
WYD	*b.* General Henry J. Hunt	933
WYE	*b.* General Henry Knox	933
WYF	*b.* General E. O. C. Ord	933
WYG	*c.* Fort Washington, Maryland	642
WYG	*b.* Colonel George Armistead	916
WYH	*b.* General Robert Anderson ..	933
WYI	*b.* Captain Charles W. Rowell	910
WYJ	*b.* General A. M. Randal	933
WYK	*b.* General Harvey Brown	933
WYL	*b.* General R. B. Ayres	933
WYM	*b.* Captain James Fornance	910
WYN	*b.* Reno WYN ..	979
WYO	*b.* Major Evan Thomas	958
WYP	*b.* Captain Gregory Barrett	910
WYQ	*b.* Major Albert G. Gorse	958
WYS	*b.* General G. W. Gettey	933
WYT	*b.* Captain A. M. Wetherill ..	910
WYU	*b.* General Robert W. Swartoot ..	933
WYV	*b.* General S. B. Holobaird	933
WYW	*b.* General R. H. Jackson	933
WYX	*c.* Tientsin	583
WYY	*b.* General Richard Arnold	933
WYZ	*b.* Captain T. M. Morrison ..	910
WZA	*c.* Fort Screven ..	642
WZB	*c.* Fort Howard ..	641
WZC	*c.* Fort Whitman ..	642
WZD	*c.* Fort Barrancas ..	641
WZE	*c.* Fort Constitution ..	641
WZF	*c.* Fort Moultrie ..	642
WZH	*c.* Port Eads, Louisiana	650
WZJ	*c.* Fort Casey	641
WZK	*c.* Fort Dade	641
WZL	*c.* Buckroe	637
WZN	*c.* Fort Dupont ..	641
WZO	*c.* Fort Bliss	641
WZP	*c.* Fort Huachuca ..	641
WZQ	*b.* General Timothy Pickering	934
WZR	*b.* General Nathaniel Greene	933
WZS	*b.* Henry Wilson ..	939
WZT	*b.* General George H. Weeks	933
WZU	*b.* Sprigg Carroll ..	989

		PAGE
WZV	*b.* General J. M. Brannon	933
WZW	*b.* General R. N. Batchelder ..	933
WZX	*b.* General Miffin ..	933
WZY	*b.* Major Guy Howard	958
WZZ	*b.* S. Pedro	1002
WBAI	*b.* Heffron	938
WBEE	*b.* Afalkey	897
WBEI	*b.* Airlie	897
WBIA	*b.* Chipchung	913
WBII	*b.* Alpace	899
WBIO	*b.* Baxley	904
WBIU	*b.* Pascagoula.. ..	973
WBOA	*b.* Mono	963
WBOU	*b.* Nashotah	966
WBUA	*b.* Lake Gravity ..	953
WBUE	*b.* Lake Greenbrier ..	953
WBUO	*b.* Lake Grogan ..	953
WBUU	*b.* Lake Forney ..	957
WCAA	*b.* Bobring	906
WCAE	*b.* Bottineau	906
WCAO	*b.* Caponka	910
WCEA	*b.* Cotteral	919
WCEE	*b.* Kuwa	947
WCEI	*b.* Maratanza	959
WCIA	*b.* Bellingham ..	905
WCIE	*b.* Eastport	927
WCII	*b.* Invincible	942
WCIO	*b.* Lake Lemando ..	953
WCIU	*b.* Naiwa	965
WCOA	*b.* Battahatchee ..	904
WCOE	*b.* Socony 84	987
WCOI	*b.* Socony 92	987
WCOU	*b.* Lake Kyttle ..	953
WCUA	*b.* Lake Forsby ..	951
WCUE	*b.* Lake Fossil.. ..	951
WCUU	*b.* Lake Fray	951
WDAA	*b.* Munra	965
WDAE	*b.* Musketo	965
WDAO	*b.* Herman Winter ..	939
WDAU	*b.* Wanzu	1008
WDEA	*b.* Wihaha	1014
WDEE	*b.* Andra	899
WDEI	*b.* Crawlkeys	919
WDEO	*b.* Steadfast	990
WDEU	*b.* Bayamo	904
WDIA	*b.* South Pole	988
WDIA	*b.* Wakan	1008
WDIE	*b.* Wathena	1009
WDII	*b.* Watonwan	1009
WDIO	*b.* Westmead	1012
WDIU	*b.* West View	1013
WDOA	*b.* Agwidale	897
WDOE	*b.* Auburn	902
WDOI	*b.* Cape May	909
WDOO	*b.* Federal	930
WDUA	*b.* Lake Frazee ..	951
WDUE	*b.* Redlands	979
WDUI	*b.* Lake Freeborn ..	951
WDUO	*b.* Lake Freed.. ..	951
WDUU	*b.* Lake Freeland ..	951
WEOI	*b.* Osakis	971
WFAE	*b.* West Galeta ..	1011
WFAI	*b.* Western Hope ..	1011
WFAO	*b.* Volunteer	1007
WFEA	*b.* Eastern King ..	927
WFEE	*b.* Winding Gulf ..	1016
WFEI	*b.* West Hosokie ..	1011

		PAGE
WFEO	*b.* Westport	1013
WFEU	*b.* Matanzas	959
WFII	*b.* Major Wheeler ..	958
WFIU	*b.* Cerrito	912
WFOA	*b.* Hickman	939
WFOE	*b.* Lewis Luckenbach..	955
WFOO	*b.* William N. Page ..	1014
WFOU	*b.* Phoenix Bridge ..	974
WFUA	*b.* Lake Freezout ..	951
WFUE	*b.* Lake Frenchton ..	951
WFUI	*b.* A. E. R. Schneider	897
WFUU	*b.* Oskosh	971
WGAA	*b.* Englewood	928
WGAE	*b.* Galesburg	933
WGAI	*b.* Morristown ..	963
WGAO	*b.* W. S. Rheem ..	1016
WGAU	*b.* Laforge	948
WGEA	*b.* Easterner	926
WGEE	*b.* Alvada	899
WGEI	*b.* East Indian ..	927
WGIA	*b.* West Grama ..	1011
WGIE	*b.* Nantahala	965
WGIO	*b.* Saris	984
WGOE	*b.* Polar Bear ..	974
WGOI	*b.* Sacarappa	981
WGOO	*b.* Waubesa	1009
WGOU	*b.* West Gressy ..	1010
WGUA	*b.* Oskawa	971
WGUE	*b.* Itanca	942
WGUI	*b.* Brandywine ..	907
WGUU	*b.* Wayhut	1009
WIGM	*b.* Greene	955
WJAA	*b.* Sangamon	984
WJAE	*b.* Hokah	941
WJAI	*b.* Yuma	1017
WJAO	*b.* M. J. Scanlon ..	962
WJEA	*b.* Mojave	963
WJEE	*b.* Red Cloud	978
WJEI	*b.* Plainfield	975
WJEO	*b.* Phoenix WJEO ..	974
WJEU	*b.* Panga	972
WJIA	*b.* West Zucker ..	1013
WJIE	*b.* Guimba	936
WJII	*b.* Oskaloosa	971
WJIO	*b.* Independence ..	941
WJIU	*b.* Schenectady ..	984
WJOA	*b.* West Elcasco ..	1010
WJOE	*b.* West Eldara ..	1010
WJOI	*b.* West Loquassuck ..	1012
WJOO	*b.* West Madaket ..	1012
WJOU	*b.* West Kyska ..	1012
WJUI	*b.* Cohasset	916
WJUO	*b.* Magunkook ..	957
WJUU	*b.* Bulana	908
WKAE	*b.* Socony 85	987
WKAI	*b.* Lake Zaliski ..	954
WKAO	*b.* Lake Pickaway ..	954
WKAU	*b.* Lake Copley ..	949
WKEA	*b.* Lake Deval ..	949
WKEE	*b.* Lake Cahoon ..	949
WKEI	*b.* Lake Ypsilanti ..	954
WKEO	*b.* Goodspeed	935
WKEU	*b.* Borges	906
WKIA	*b.* Fish Hawk WKIA..	930
WKII	*b.* Eastern Light ..	927
WKIO	*b.* Eastern Shore ..	927
WKIU	*b.* Eastern Cross ..	926
WKOE	*b.* Falmouth ..	929
WKOI	*b.* Cumberland WKOI	920
WKOO	*b.* Connersville ..	911
WKOU	*b.* Central American ..	911
WKUI	*b.* Western Belle ..	1010
WLAA	*b.* Sarcoxie	984
WLAE	*b.* Barlow	903
WLAI	*b.* Lake Grandon ..	952
WLEA	*b.* Lake Farge ..	950
WLEE	*b.* Lake Faristell ..	950
WLEI	*b.* Lake Forkville ..	951
WLEO	*b.* Lake Cathcoon ..	949
WLEU	*b.* Lake Fugard ..	951
WLIA	*b.* S. Teresa	1002
WLII	*b.* Goree	935
WLIO	*b.* Nantasket	965
WLIU	*b.* Bologan	906
WLKZ	*b.* Montpelier	963
WLOA	*b.* Neeolah	966
WLOE	*b.* Nupolela	968
WLOO	*b.* Cadaretta	909
WLOU	*b.* Bark Hamstead ..	903
WLUA	*b.* Latoka	955
WLUE	*b.* Haverhill	938
WLUO	*b.* Alcona	898
WLUU	*b.* Ingold	941
WMAA	*b.* Lake Furley ..	951
WMAE	*b.* Cowenshannock ..	919
WMAI	*b.* Cowboy	919
WMAO	*b.* Cowee	919
WMEA	*b.* Costilla	918
WMEE	*b.* Cote Blanche ..	918
WMEI	*b.* Cotopaxi	919
WMEO	*b.* Cottonplant ..	919
WMEU	*b.* Cottonwood ..	919
WMIA	*b.* Coconino	916
WMIO	*b.* W. H. McGean ..	1013
WMIU	*b.* Chales L. Hutchinson	912
WMOA	*b.* Tillamook	1004
WMOI	*b.* Braeburn	907
WMOO	*b.* Owatama	971
WMOU	*b.* Klamath WMOU ..	947
WMUA	*b.* Wheaton	1013
WMUE	*b.* Cokato	916
WMUI	*b.* Charlot	912
WMUO	*b.* Panola	972
WMUU	*b.* Aiken	897
WNAA	*b.* Craincreek	919
WNAE	*b.* Cranenest	919
WNAI	*b.* Craycroft	919
WNAO	*b.* Lake Callicoon ..	949
WNEA	*b.* Lake Charlottesville	949
WNEO	*b.* Dio	923
WNEU	*b.* Coweta	919
WNIA	*b.* Cruso	920
WNIE	*b.* Agawam	897
WNII	*b.* Challenger	912
WNIO	*b.* Python	976
WNIU	*b.* Cornucopia ..	918
WNOE	*b.* Fort Riley	931
WNOU	*b.* Fort Russell ..	931
WNUA	*b.* Anthera	900
WNUE	*b.* Blakeley	905
WNUI	*b.* Bockonoff	906
WPAA	*b.* Balsto	903
WPAE	*b.* Sag Harbor ..	983
WPAI	*b.* Yomachichi ..	1017
WPAO	*b.* Wilscox	1015
WPEA	*b.* Belamquan ..	904
WPIA	*b.* Corilla	918

		PAGE
WPIE	*b.* Corrales	918
WPIO	*b.* Lake Fostoria ..	951
WPIU	*b.* Lake Fouche ..	951
WPOE	*b.* Chibiabos	913
WPOI	*b.* Dungeness WPOI ..	923
WPOO	*b.* Washtenaw ..	1009
WPOU	*b.* Charles M. Everest	912
WPUE	*b.* Caddopeak	909
WPUI	*b.* Callabasas	909
WPUO	*b.* Cascade	911
WPUU	*b.* Coaxet	916
WQAI	*b.* Agria	897
WQAU	*b.* Hoosac	940
WQEE	*b.* Everglades	929
WQEO	*b.* West Zula	1013
WQEU	*b.* Canibas	909
WQIE	*b.* Bedminster	904
WQII	*b.* Holbrook WQII ..	940
WQIO	*b.* Neponset	966
WQIU	*b.* Swampscott ..	1001
WQOA	*b.* Tipton	1004
WQOE	*b.* Garfield	933
WQOI	*b.* Tolo	1005
WQOO	*b.* Folsom	931
WQOU	*b.* Bugaya	908
WQUA	*b.* Cokesit	916
WQUE	*b.* Edgecombe	927
WQUI	*b.* Flavel	931
WQUO	*b.* Iconium	941
WQUU	*b.* Jacona	943
WRAE	*b.* Amabala WRAE ..	897
WRAI	*b.* Allegheny WRAI ..	898
WREA	*b.* West Lashaway ..	1012
WREE	*b.* Wauconda ..	1009
WREI	*b.* Quistconck ..	977
WREO	*b.* Zirkel	1017
WRIA	*b.* Aowa	900
WRIE	*b.* Lake Gorin ..	952
WRIO	*b.* Star I	989
WRIU	*b.* Quinneseco ..	977
WROA	*b.* Westpool	1013
WROE	*b.* Indianapolis ..	941
WROI	*b.* Lydia WROI ..	957
WROO	*b.* E. L. Doheny, III ..	928
WRUA	*b.* Kangi	945
WRUE	*b.* Governor John Lind	935
WRUE	*b.* Medford	961
WRUI	*b.* Okiya	969
WRUO	*b.* Quittcas	977
WRUU	*b.* Wakiki	1008
WSAE	*b.* Apalachee	900
WSAO	*b.* Alabat	897
WSAU	*b.* Bagose	902
WSEA	*b.* Defiance	922
WSEE	*b.* W. L. Steed ..	1015
WSEI	*b.* Cricket	919
WSEU	*b.* Lake Buckeye ..	948
WSIA	*b.* Caribou	910
WSIE	*b.* Harish	937
WSII	*b.* Casmailia	911
WSOE	*b.* Mount Rainier ..	964
WSOI	*b.* West Sequana ..	1013
WSOO	*b.* Crathorne	919
WSOU	*b.* Lewiston	955
WSUA	*b.* West Helix ..	1011
WSUE	*b.* West Wauna ..	1013
WSUI	*b.* West Wauneke ..	1013
WSUU	*b.* Lake Gradan ..	952
WTAA	*b.* Lake Beacon ..	948

		PAGE
WTAE	*b.* Lake Desha ..	949
WTAI	*b.* Lake Mattato ..	953
WTAO	*b.* Lake Licoco ..	953
WTAU	*b.* Campello	909
WTEE	*b.* Cedar Spring ..	911
WTEI	*b.* Ceralvo	911
WTEO	*b.* Cerosco	911
WTEU	*b.* Coperas	918
WTIA	*b.* Fernandina WTIA	930
WTII	*b.* Socony 90	987
WTIO	*b.* Socony 94	987
WTIU	*b.* Deerfield	921
WTOA	*b.* Allison	899
WTOE	*b.* Amoron	899
WTOI	*b.* Belair	904
WTOO	*b.* Toiler	1004
WTOU	*b.* Coulee	919
WTUE	*b.* Laurel WTUE ..	955
WTUI	*b.* Calvert	909
WTUO	*b.* Houma	940
WTUU	*b.* West Mahomet ..	1012
WUAA	*b.* Mount Vernon ..	964
WUBA	*b.* Camp Alfred Vail, New Jersey ..	638
WUBC	*c.* Camp Knox, Kentucky	638
WUBD	*c.* Fort Sill	642
WUCA	*c.* Camp Stotsenburg	618
WUCB	*c.* Camp John Hay ..	618
WVAA	*b.* Coquina	918
WVAE	*b.* Corapeak	918
WVAI	*b.* Corcoran	918
WVAO	*b.* Conotton	917
WVAU	*b.* Contoocook ..	917
WVEE	*b.* Alanthus	898
WVEI	*b.* Basco	903
WVEO	*b.* Banago	903
WVEU	*b.* Isanti	942
WVIA	*b.* Lake Gormania ..	952
WVIE	*b.* Yamhill	1016
WVII	*b.* Buhisan	908
WVIU	*b.* Lake Govan ..	952
WVOE	*b.* Couparle	919
WVOI	*b.* Courtois	919
WVOO	*b.* Coushatta	919
WVOU	*b.* Coutolene	919
WVUA	*b.* Courageous WVUA	919
WVUE	*b.* J. B. Stetson ..	943
WVUI	*b.* Arado	900
WVUO	*b.* Aimwell	897
WVUU	*b.* Kanakee	945
WXAA	*b.* Ozaukee	971
WXAO	*b.* Danebrog	921
WXAU	*b.* Keota	946
WXEI	*b.* Western Comet ..	1010
WXEO	*b.* West Cape ..	1010
WXEU	*b.* Yukon	1017
WXFA	*b.* Western Scout ..	1011
WXIA	*b.* Victorious	1007
WXIE	*b.* Waneyanda ..	1008
WXII	*b.* Wenakee	1009
WXIO	*b.* Buckhorn ..	908
WXIU	*b.* Aberdeen WXIU ..	896
WXOA	*b.* Cowiche	919
WXOE	*b.* Crabtree	919
WXOI	*b.* Craigrownie ..	919
WXOO	*b.* Craigsmere ..	919
WXUA	*b.* Beaumont	904
WXUI	*b.* Hampden ..	937

		PAGE			PAGE
XFR	*b.* Whitwood	893	XKK	*b.* Peveril	869
XFU	*b.* Lady Wimborne ..	849	XKN	*b.* Luga	852
XFW	*b.* Glitra	838	XKO	*b.* Ranee	873
*XFZ	*b.* Notanda	864	XKP	*b.* Rajah	873
XGC	*b.* Dumra	830	XKQ	*b.* Woodville	894
XGE	*b.* Zaida	895	XKU	*b.* Hans Hemsoth ..	841
XGF	*b.* Zira	895	XKV	*b.* Clan Macmillan ..	822
XGG	*b.* Bulimba	814	XKW	*b.* Valemore	889
XHC	*b.* Eskason XHC ..	833	XKX	*b.* Westhope	893
XHD	*b.* Mapleton	856	XKY	*b.* Montezuma ..	860
XHG	*b.* Edmonton ..	831	XKZ	*b.* Castellano	817
XHH	*b.* Tintern Abbey ..	886	XLD	*b.* Oakwin	864
XHI	*b.* Hotham Newton ..	843	XLG	*b.* Bradavon	813
XHK	*b.* Boverton	812	XLH	*b.* Argalia	805
XHL	*b.* Grelrosa	839	XLK	*b.* Trevean	887
XHM	*b.* Upminster ..	889	XLM	*b.* Mount Everest ..	860
XHN	*b.* Relentless	874	XLN	*b.* Baron Blantyre ..	809
XHO	*b.* Port Nicholson ..	871	XLP	*b.* Warina	892
XHP	*b.* Port Bowen ..	870	XLQ	*b.* Tibermede	886
XHQ	*b.* Port Caroline ..	870	XLS	*b.* Trojan Prince ..	888
XHS	*b.* Pollensa	869	XLY	*b.* Tewkesbury ..	885
XHU	*b.* Sheridan	879	XLZ	*b.* Relillio	874
XHV	*b.* Sidlaw Range ..	880	XMA	*b.* Woodburn	894
XHX	*b.* Ryburn	877	XMB	*b.* Lorina	851
XHY	*b.* Rexmore	874	XMC	*b.* Redruth	874
XHZ	*b.* Sweethope ..	883	XMK	*b.* War Begum ..	891
XIA	*b.* Volsella	891	XML	*b.* War Nawab ..	892
XIC	*b.* Andalusian ..	804	XMM	*b.* War Diwan ..	892
XID	*b.* Norburn	863	XMN	*b.* War Gaekwar ..	892
XIE	*b.* Polycarp	869	XMP	*b.* Cape of Good Hope	816
XIG	*b.* Maindy Forest ..	854	XMT	*b.* Sheaf Lance ..	879
XIH	*b.* Petworth	869	XMU	*b.* Rajput	873
XII	*b.* Serbino	879	XMV	*b.* Roquelle	875
XIJ	*b.* Gileston	837	XMY	*b.* Ardgowan	805
XIK	*b.* Deerwood	828	XMZ	*b.* Tullamore	888
XIL	*b.* Muneric	861	XNB	*b.* Tung-An	675
XIN	*b.* Bonny	812	XNC	*b.* Yung-Tsih	675
XIO	*b.* Glenshane	838	XNF	*b.* Yung-Fung	675
XIP	*b.* Ainsdale	802	XNG	*b.* Yung-Chion ..	675
XIR	*b.* Varzin	889	XNL	*b.* Foo-An	675
XIT	*b.* Menapian	858	XNO	*b.* Yu-Chang	675
XIU	*b.* Gothic Prince ..	839	XNP	*c.* Canton	582
XIV	*b.* Slavic Prince ..	880	XNS	*b.* Nan-Shen	675
XIW	*b.* Gaelic Prince ..	835	XNW	*b.* Chao-Ho	675
XIX	*b.* Celtic Prince ..	817	XNY	*b.* Yung-Kien	675
XIZ	*b.* Persian Prince ..	868	XOA	*b.* Chu-Tai	675
XJA	*b.* River Dart.. ..	875	XOC	*c.* Wuchang	583
XJB	*b.* Hatimura	841	XOD	*b.* Chu-Tung	675
XJD	*b.* Clan Macbean ..	821	XOG	*b.* Chu-Kwan	675
XJE	*b.* Clan Alpine ..	820	XON	*b.* Chu-Chien	675
XJF	*b.* Cahiracon	815	XOU	*b.* Chu-Yu	675
XJH	*b.* Henry Holmes ..	841	XOW	*c.* Foochow	583
XJI	*b.* Rion	874	XOY	*b.* Chu-Yew	675
XJJ	*b.* Kura	849	XPF	*b.* Tung-Chi	675
XJK	*b.* Cairnvalona ..	815	XPK	*c.* Peking XPK ..	583
XJL	*b.* Sydney Reid ..	883	XPN	*b.* Kien-An	675
XJM	*b.* Nilemede	863	XPO	*b.* Kien-Kong	675
XJN	*b.* Islandia	845	XPS	*b.* Fei-Ying	675
XJO	*b.* Maimyo	853	XPW	*b.* Kien-Wei	675
XJP	*b.* Malancha	854	XQC	*b.* Kiang-Chien ..	675
XJQ	*b.* Macharda	853	XQH	*b.* Kiang-Han	675
XJU	*b.* Australier XJU ..	807	XQL	*c.* Kalgan	583
XJW	*b.* Cape Natal.. ..	815	XQR	*b.* Kiang-Li	675
XJX	*b.* War Spray	892	XQU	*b.* Kiang-Yuen ..	675
XKB	*b.* Tregonell	887	XQW	*b.* King-Ching	675
XKC	*b.* Treneglos	887	XRC	*b.* Lien-Chin	675
XKD	*b.* Trevose	888	XSC	*b.* Hai-Chi	675
XKG	*b.* Lesto	850	XSF	*b.* Ying-Swei	675
XKJ	*b.* Levensau	851	XSG	*c.* Woosung, Kiangsu	583

		PAGE
XSH	*c.* **Shanghai**	583
XSI	*b.* Hao-Kia	675
XSJ	*b.* Hao-Y	675
XSK	*b.* Hao-Pine	675
XSL	*b.* Hao-Tine	675
XSM	*b.* Hao-Ou	675
XSP	*b.* Hai-Shen	675
XSU	*c.* Tsungming ..	583
XSU	*c.* Tsungming Kiang-su	583
XSW	*b.* Hai-Chew	675
XSY	*b.* **Hai-Yung**	675
XTK	*b.* Bahadur	807
XTO	*b.* Beaverton	810
XUC	*b.* Krasnoiarsk XUC ..	849
XUF	*b.* Sumatra XUF ..	882
XUJ	*b.* Tremeadow ..	887
XUK	*b.* Polshannon ..	869
XUO	*b.* Tresillian	887
XVA	*b.* **Canadian Warrior** ..	669
XVB	*b.* **Glenorchy** XVB ..	670
XVD	*b.* Lucknowa	671
XVE	*b.* Quebec	672
XVF	*b.* **Canadian Ranger** ..	669
XVG	*b.* Belchers	668
XVI	*b.* Westmount XVI ..	673
XVK	*b.* **Canadian Recruit** ..	669
XVL	*b.* **Mariska**	671
XVM	*b.* **Canadian Volunteer**	669
XVP	*b.* **Canadian Trader** ..	669
XVQ	*b.* Algerine	668
XVR	*b.* **Canadian Sailor** ..	669
XVS	*b.* Canadian Seigneur ..	669
XVU	*b.* Canadian Signaller	669
XVV	*b.* **Sable I**	672
XVW	*b.* Baffin	668
XVX	*b.* **Turret Crown** ..	673
XVY	*b.* Frontenac	835
XVY	*b.* Vaudreuil	673
XWB	*b.* Iver Heath ..	845
XWC	*b.* General William ..	836
XWD	*b.* **Canadian Adventurer**	668
XWE	*b.* Canadian Gunner ..	669
XWG	*b.* Canadian Aviator ..	668
XWH	*b.* Canadian Sower ..	669
XWI	*b.* Canadian Settler ..	669
XWJ	*b.* Canadian Navigator	669
XWK	*b.* Canadian Sealer ..	669
XWL	*b.* E. D. Kingsley ..	670
XWM	*b.* Canadian Spinner ..	669
XWN	*b.* Canadian Raider ..	669
XWO	*b.* Canadian Rancher ..	669
XWP	*b.* Canadian Planter ..	669
XWQ	*b.* Canadian Importer	669
XWR	*b.* Canadian Exporter	669
XWS	*b.* Canadienne (La) ..	669
XWT	*b.* Canadian Inventor	669
XWU	*b.* Canadian Prospector	669
XWV	*b.* Canadian Miner ..	669
XWW	*b.* Valcartier	673
XWX	*b.* Canadian Farmer ..	669
XWY	*b.* Canadian Beaver ..	669
XWZ	*b.* Cote Nord	670
XXB	*b.* Rosyth Castle ..	876
XXD	*b.* Warla	802
XXE	*b.* Baldina	808
XXO	*b.* Cape Premier ..	816
XXT	*b.* Cormount	826
XXY	*b.* **Harald Casper** ..	841

		PAGE
XYN	*b.* Canadian Trooper ..	699
XYZ	*b.* Canadian Miller ..	669
YN	*c.* Lyons	593
YAA	*b.* Argonauta	805
YAC	*b.* Bogota	812
YAD	*b.* Dromore Castle ..	830
YAE	*b.* Beechwood ..	810
YAF	*b.* Settler	879
YAG	*b.* Anglier	804
YAM	*b.* Laristan	850
YAN	*b.* Bratton Castle ..	813
YAQ	*b.* Dunaff Head ..	828
YAR	*b.* Harlow	841
YAT	*b.* Ravenshoe	873
YAU	*b.* Homefield	843
YAV	*b.* Arachne	805
YAX	*b.* Dundrum Castle ..	830
YAY	*b.* Grindon Hall ..	840
YBA	*b.* Waltham	891
YBB	*b.* Kaiping	840
YBC	*b.* Nizam	863
YBE	*b.* Maskinonge ..	857
YBF	*b.* Bampton Castle ..	808
YBG	*b.* Astrakhan YBG ..	807
YBH	*b.* Otterburn	866
YBL	*b.* Gray	839
YBM	*b.* Warawala	891
YBO	*b.* Normandier ..	863
YBR	*b.* Yildum YBR ..	895
YBS	*b.* Helcion	841
YBT	*b.* Kamenetz Podolsk YBT	847
YBU	*b.* Warepa	892
YBW	*b.* Porsanger	870
YCA	*b.* Benwood	811
YCB	*b.* Bisley	811
YCC	*b.* Fantee	834
YCD	*b.* Thurland Castle ..	886
YCE	*b.* Northborough ..	863
YCF	*b.* Biafra	811
YCH	*b.* Courtfield	826
YCI	*b.* Trevanion	887
YCJ	*b.* Monkshaven ..	860
YCK	*b.* Loyal Citizen ..	852
YCM	*b.* Edith Cavell YCM ..	831
YCO	*b.* Bodnant	812
YCQ	*b.* Bokana	807
YCR	*b.* South Pacific ..	881
YCU	*b.* Levnet	851
YCV	*b.* Spectator	881
YCW	*b.* Bayramento ..	810
YCX	*b.* Caithness	815
YCY	*b.* Phorus	869
YCZ	*b.* Boutry	812
YDB	*b.* Carlow Castle ..	816
YDC	*b.* Bereby	811
YDD	*b.* Earlswood	831
YDE	*b.* Anchoria	804
YDF	*b.* Glensloy	838
YDH	*b.* Rheinfels	874
YDI	*b.* Rossia YDI ..	876
YDJ	*b.* Hollypark	843
YDL	*b.* Dront	830
YDM	*b.* Chertsey	818
YDO	*b.* Westra	893
YDP	*b.* Crane	827
YDR	*b.* Maindy Grange ..	856
YDT	*b.* Kingsbury	848
YDW	*b.* **Lingfield**	851

		PAGE
YDX	*b.* Frankburn	835
YDY	*b.* Lord Downshire	851
YDZ	*b.* Bellfield	810
YEA	*b.* Sunik	882
YEB	*b.* Batanga	809
YEC	*b.* Badagry	807
YED	*b.* Holywell	843
YEF	*b.* Barracoo	808
YEG	*b.* Helmsdale	841
YEH	*b.* Marie Rose YEH	856
YEK	*b.* Baron Minton	809
YEL	*b.* S. Dunstan	883
YEM	*b.* Bendoran	810
YEN	*b.* Huntshead	844
YEP	*b.* Glenmorag	837
YEQ	*b.* Scatwell	878
YER	*b.* Gladiator	837
YES	*b.* Clan Kenneth	821
YEW	*b.* Breconian	813
YEX	*b.* Zimorodok	895
YEY	*b.* Lydia	853
YFA	*b.* Pecton	869
YFC	*b.* Lumina	852
YFD	*b.* Imber	844
YFG	*b.* Ariano	806
YFH	*b.* Cabotia	815
YFI	*b.* Aungban	807
YFJ	*b.* Hopelyn	843
YFL	*b.* Mottisfont	860
YFM	*b.* Penare	867
YFN	*b.* Innerton	845
YFP	*b.* Sheafmead	879
YFR	*b.* Grelben	839
YFS	*b.* Grelarlie	839
YFT	*b.* Elder Branch	831
YFV	*b.* Lord Rhondda	851
YFW	*b.* Albistan	803
YFY	*b.* Algorta	803
YFZ	*b.* Marshal Allenby	857
YGA	*b.* Mokta	859
YGB	*b.* Boukadra	812
YGC	*b.* Huddersfield	843
YGC	*b.* Stellina	882
YGD	*b.* Franktor	835
YGE	*b.* Roseden	876
YGF	*b.* Halesius	840
YGG	*b.* Trevaylor	887
YGH	*b.* Alpine Range	803
YGI	*b.* Clearton	824
YGJ	*b.* Chingford	818
YGK	*b.* Teespool	885
YGL	*b.* Port Darwin	870
YGM	*b.* Pot Denison	870
YGN	*b.* Tenterden	885
YGP	*b.* Paul Paix	867
YGQ	*b.* Whimbrel	893
YGR	*b.* Irish Monarch	845
YGS	*b.* Magdala	853
YGU	*b.* Ladykirk	849
YGV	*b.* Peterton	868
YGW	*b.* Tiberton	886
YGX	*b.* Glofield	838
YGY	*b.* Ravelston	873
YGZ	*b.* Eastern City	831
YHA	*b.* Haleric	840
YHB	*b.* Pendarves	867
YHC	*b.* Helredale	841
YHF	*b.* Frankier	835
YHG	*b.* Morinier	860
YHH	*b.* Luceric	852
YHL	*b.* Adra	802
YHN	*b.* Alaveño	803
YHO	*b.* Electrician	831
YHP	*b.* Baymingo	810
YHQ	*b.* Redbridge	873
YHR	*b.* Cornish City	826
YHS	*b.* Lancashire	849
YHT	*b.* Clintonia	825
YHW	*b.* Rhio	874
YHX	*b.* Baymano	810
YHY	*b.* Slav	880
YHZ	*b.* Clam	820
YIB	*b.* Venetian	890
YID	*b.* Arranmead	806
YIE	*b.* Castlemead	817
YIF	*b.* Dalemead	827
YIH	*b.* River Taff	875
YII	*b.* Hazelmoor	841
YIJ	*b.* Inchmead	844
YIK	*b.* Lowmead	852
YIL	*b.* Orangemead	865
YIM	*b.* Pearlmead	867
YIR	*b.* Zurichmead	895
YIS	*b.* Trelawny	887
YIU	*b.* Ethelstan	833
YIV	*b.* Salacia	877
YIW	*b.* Trevilley	887
YIX	*b* Finchley	834
YIZ	*b.* S. Michael	884
YJB	*b.* Black Prince	811
YJC	*b.* Abaris	801
YJD	*b.* Chinese Prince	818
YJG	*b.* Tuscan Prince	888
YJH	*b.* Southern Isles	881
YJI	*b.* Royal Prince	876
YJJ	*b.* British Marshall	814
YJK	*b.* Tudor Prince	888
YJL	*b.* Maindy Dene	854
YJM	*b.* Bosworth	812
YJN	*b.* Author	807
YJO	*b.* Clan Maclaren	822
YJP	*b.* Clan Sutherland	824
YJQ	*b.* Clan Macaulay	821
YJR	*b.* Domira	829
YJS	*b.* Benlawers	811
YJT	*b.* Alberta YJT	803
YJV	*b.* H. M. Pellatt	840
YJX	*b.* Bithina	811
YKA	*b.* Curaca	827
YKE	*b.* Enfield	832
YKG	*b.* Eskbridge	833
YKH	*b.* Alston	803
YKI	*b.* Hounslow	843
YKK	*b.* Stork YKK	882
YKL	*b.* Ilford	844
YKO	*b.* Fionashell	834
YKP	*b.* Romney YKP	875
YKQ	*b.* Putney	872
YKR	*b.* Ferngarth	834
YKT	*b.* S. Patrick YKT	884
YKV	*b.* Karnak	847
YKW	*b.* Penrhoss	868
YKX	*b.* Bembridge	810
YKZ	*b.* Sikh	880
YLB	*b.* Ortinashell	866
YLC	*b.* Noelle	863
YLD	*b.* Darnholme	828
YLE	*b.* Watsness	893

		PAGE			PAGE
YLF	*b.* Kut	849	YPM	*b.* S. Margaret of Scotland	884
YLG	*b.* Gregory	839	YPN	*b.* Grainton	839
YLI	*b.* Lanuvium	850	YPO	*b.* Peleus	867
YLK	*b.* Khartum	848	YPP	*b.* Teenkai	885
YLL	*b.* Daghestan	827	YPR	*b.* Cuthbert	827
YLM	*b.* Yarborough	805	YPS	*b.* Clan Macbrayne	821
YLN	*b.* Livingstonia	851	YPT	*b.* Valdura	889
YLT	*b.* Benarty	810	YPW	*b.* Portrushton	871
YLU	*b.* Benledi	811	YPX	*b.* Hellopes	841
YLV	*b.* Pikepool	869	YPZ	*b.* Hindoo	842
YLW	*b.* Marshal Haig	857	YQA	*b.* Bassano	809
YLX	*b.* Pengelly	867	YQC	*b.* Archimedes	805
YLY	*b.* Flaminian	834	YQH	*b.* Portsea	871
YLZ	*b.* Methven	859	YQJ	*b.* Competitor	825
YMA	*b.* Clifftower	825	YQK	*b.* Maresfield	856
YMC	*b.* Jedmead	846	YQL	*b.* Norman Monarch	863
YMD	*b.* Kelsomead	846	YQR	*b.* British Soldier	814
YME	*b.* Sapele	877	YQU	*b.* Eurydamas	833
YMF	*b.* Nembe	862	YQV	*b.* Maindy Hill	854
YMG	*b.* Palma YMG	866	YQW	*b.* Marinula	856
YMI	*b.* Warri	892	YQX	*b.* Admiral Cochrane	802
YMJ	*b.* Boulama	812	YQZ	*b.* Eurymachus	833
YMK	*b.* Ancobra	804	YRA	*b.* Eurymedon	833
YMM	*b.* Egwanga	831	YRB	*b.* Bradclyde	813
YMP	*b.* Cedar Branch	817	YRC	*b.* Lord Kelvin	851
YMQ	*b.* Marylebone	857	YRD	*b.* Amarna	803
YMT	*b.* Amasis	803	YRE	*b.* Tarantia	885
YMX	*b.* Nivose	863	YRG	*b.* Euryades	833
YMX	*b.* Riverdale	875	YRH	*b.* Eurybates	833
YMZ	*b.* Pensilva	868	YRI	*b.* Eurylochus	833
YNA	*b.* Woodfield	894	YRJ	*b.* Eurypylus	833
YNB	*b.* Orator	865	YRN	*b.* Grecian Prince	839
YNC	*b.* Biela	811	YRO	*b.* Huntsgreen	844
YND	*b.* Ardoyne	805	YRS	*b.* Korean Prince	849
YNE	*b.* Mortlake	860	YRT	*b.* Glendevon	837
YNF	*b.* Camillo	815	YRW	*b.* King Edward YRW	848
YNK	*b.* Mount Etna	860	YRX	*b.* Trevince	887
YNL	*b.* Wabana	891	YRY	*b.* Prinses Juliana YRY	872
YNO	*b.* City of Versailles	820	YRZ	*b.* Huntsend	844
YNX	*b.* Leonard	850	YSC	*b.* Miltonstar	859
YNX	*b.* Limax	851	YSD	*b.* Nitonian	863
YNT	*b.* Othello	866	YSE	*b.* Melville	858
YNU	*b.* Glenorchy	837	YSG	*b.* Ramore Head	873
YNW	*b.* Baysarnia	810	YSI	*b.* Jamaica	845
YNY	*b.* Boveric	817	YSK	*b.* Camito	815
YOA	*b.* Mentor	858	YSL	*b.* Alconda	803
YOG	*b.* Clan Mackinnon	822	YSM	*b.* City of Canton	819
YOH	*b.* Clan Cumming	820	YSN	*b.* Australia YSN	807
YOJ	*b.* Stentor	882	YSO	*b.* Canastota	815
YOL	*b.* Mackinaw	853	YSP	*b.* Cranley	827
YOM	*b.* Mahopac	853	YST	*b.* Karapara	847
YON	*b.* Clan Lamont	821	YSY	*b.* Colonial	825
YOO	*b.* Clan Lindsay	821	YSZ	*b.* Polyphemus	870
YOP	*b.* Wye Tempest	805	YTA	*b.* Prometheus	872
YOR	*b.* Cavour	817	YTB	*b.* City of Oran	819
YOS	*b.* Strabo	882	YTC	*b.* Matador	857
YOT	*b.* Phidias	869	YTD	*b.* Mumbles Light	861
YOV	*b.* Ningchow	863	YTE	*b.* Defender	828
YOW	*b.* Deucalion	829	YTH	*b.* Murillo	861
YOX	*b.* Teesbridge	885	YTI	*b.* Clan Mackay	822
YOY	*b.* Pyrrhus	872	YTJ	*b.* Mandala	855
YOZ	*b.* Lycaon	852	YTM	*b.* Mercuria	858
YPE	*b.* Oyleric	866	YTN	*b.* Orestes	865
YPF	*b.* Poplar Branch	870	YTO	*b.* Priam	871
YPG	*b.* Novian	864	YTR	*b.* Servian Prince	879
YPH	*b.* Line Branch	851	YTS	*b.* Corloch	826
YPJ	*b.* Hambleton Range	840	YTT	*b.* Mattawa	857
YPK	*b.* Crenella	827			
YPL	*b.* Justin	846			

		PAGE
YUF	*b.* **Hermeline**	728
YUH	*b.* Eastern	831
YUK	*b.* City of Sparta	820
YUM	*b.* Anglo-Egyptian	804
YUN	*b.* Scandia	878
YUO	*b.* Sithonia	880
YUR	*b.* Drachenfels	829
YUS	*b.* Waimarino	891
YUX	*b.* Jebba	846
YUY	*b.* Hatkhola	841
YUZ	*b.* Hatarana	841
YVA	*b.* Bengloe	811
YVB	*b.* Lobo (El)	832
YVC	*b.* Burutu	815
YVD	*b.* Clutha	825
YVF	*b.* Huntress	843
YVH	*b.* Egori	831
YVI	*b.* Romera	875
YVJ	*b.* Namsang	861
YVK	*b.* Shadwell	879
YVL	*b.* Ellerdale	832
YVN	*b.* County of Carmarthen	826
YVO	*b.* Cairndhu	815
YVR	*b.* Gothicstar	839
YVS	*b.* Tuscanstar	888
YVT	*b.* Mercian	858
YVV	*b.* Clan Macbeth	821
YVY	*b.* Saxonstar	878
YVZ	*b.* Clan Buchanan	820
YWB	*b.* Rosstrevor	876
YWC	*b.* Slieve Bawn	880
YWE	*b.* Slieve Gallion	880
YWF	*b.* Slievemore	880
YWG	*b.* Snowdon	880
YWH	*b.* South Stack	881
YWI	*b.* Duke of Connaught	830
YWJ	*b.* Duke of Cumberland	830
YWK	*b.* Duke of Argyll	830
YWL	*b.* Duke of Clarence	830
YWM	*b.* Colleen Bawn	825
YWN	*b.* Mellifont	858
YWO	*b.* Mongolian Prince	860
YWP	*b.* Thorpe Grange	886
YWR	*b.* Berrima	811
YWT	*b.* Kumara	849
YWV	*b.* Rose Castle	876
YWX	*b.* Wisley	894
YXB	*b.* Eastcliffe	831
YXC	*b.* Clan Mackinlay	822
YXE	*b.* Llangollen	851
YXF	*b.* Fanad Head	834
YXG	*b.* Monette	860
YXJ	*b.* Eggesford	831
YXK	*b.* Baluchistan	808
YXL	*b.* Hartmore	841
YXM	*b.* Loyal Devonian	852
YXN	*b.* Rio Blanco	874
YXQ	*c.* Ballybunion	631
YXR	*b.* Princess Maud	872
YXS	*b.* Vardulia	889
YXT	*b.* Penolver	868
YXV	*b.* Scottish Prince	878
YXX	*b.* Clan Mackenzie	822
YXZ	*b.* Grelgrant	839
YYA	*b.* Singapore	880
YYB	*b.* Manchester Corporation	854
YYC	*b.* Anglo-Mexican	804
YYD	*b.* Myrshell	861
YYE	*b.* Lapland	850
YYF	*b.* Zeeland YYF	895
YYJ	*b.* Bassa	809
YYK	*b.* Moorish Prince	860
YYL	*b.* Kashgar	847
YYM	*b.* Vellavia	890
YYN	*b.* Siamese Prince	879
YYO	*b.* Largo	850
YYP	*b.* Michaelston	859
YYQ	*b.* City of Florence	819
YYR	*b.* Ursus	889
YYT	*b.* Orthia	866
YYU	*b.* City of Newcastle	819
YYV	*b.* City of Cairo	819
YYW	*b.* Knowsley Hall	849
YYX	*b.* Erinier	833
YYZ	*b.* Cherry Branch	818
YZA	*b.* Clan Colquhoun	820
YZB	*b.* Clan Sinclair	824
YZC	*b.* Glenshiel	838
YZG	*b.* Clan Urquhart	824
YZH	*b.* Alexandra YZH	803
YZI	*b.* Manica	855
YZJ	*b.* Warialda	892
YZK	*b.* Almanzora	803
YZL	*b.* Weehawken	893
YZM	*b.* Huronian	844
YZN	*b.* Kashmir	847
YZO	*b.* Kalyan	847
YZP	*b.* Aras	805
YZQ	*b.* Metagama	859
YZS	*b.* Berwickshire	811
YZT	*b.* Egremont Castle	831
YZV	*b.* Great Southern	839
YZW	*b.* Great Western	839
YZY	*b.* Waterford	892
ZA	*c.* Paris	593
ZAB	*b.* Glenspean	838
ZAD	*b.* Frankmere	835
ZAE	*b.* Royal Transport	876
ZAG	*b.* Thespis	886
ZAI	*b.* Telemachus	885
ZAK	*b.* Mombassa	859
ZAN	*b.* Chepstow Castle	817
ZAP	*b.* Winnebago	894
ZAR	*b.* Rathlin Head	873
ZAT	*b.* Corcrag	825
ZAU	*b.* Sarah Jolliffe	877
ZAV	*b.* Anamba	804
ZAW	*b.* Cyrena	827
ZAX	*b.* Muncaster Castle	861
ZAY	*b.* Lexington	851
ZAZ	*b.* Abadesa	801
ZBA	*b.* Lepanto ZBA	850
ZBB	*b.* Camoens	815
ZBC	*b.* Marconi	856
ZBE	*b.* Manchester Hero	855
ZBG	*b.* Tamaqua	885
ZBI	*b.* Wyncote	895
ZBJ	*b.* Devon	829
ZBL	*b.* Northumberland	863
ZBM	*b.* Westmoreland	893
ZBN	*b.* Moliere	859
ZBO	*b.* Wanderer	891
ZBS	*b.* Monarch ZBS	859
ZBT	*b.* Leitrim	850
ZBV	*b.* Salvador ZBV	877
ZBY	*b.* Norriston	863
ZBZ	*b.* Corfell	826
ZCB	*b.* Clan Macphee	822

		PAGE
ZCD	*b.* Belltown	810
ZCE	*b.* Liberty	851
ZCF	*b.* Classic	824
ZCG	*b.* Ebani	831
ZCJ	*b.* Newhaven ZCJ ..	862
ZCK	*b.* S. Denis	883
ZCN	*b.* Antinous	805
ZCO	*b.* Nottingham ..	864
ZCP	*b* Archangel	805
ZCS	*b.* Camberley ZCS ..	815
ZCX	*b.* Grelhead	839
ZCZ	*b.* Southgate	881
ZDA	*b.* Haigtown	840
ZDC	*b.* Circe Shell ..	818
ZDE	*b.* Tregarthen ..	887
ZDM	*b.* Lord Antrim ..	851
ZDO	*b.* Imani	844
ZDP	*b.* American Transport	803
ZDR	*b.* Indian Transport ..	845
ZDS	*b.* Cape Transport ..	816
ZDT	*b.* British Transport ..	814
ZDU	*b.* Canadian Transport	815
ZDV	*b.* Panama Transport	867
ZDW	*b.* Egyptian Transport	831
ZDX	*b.* Vera Kathleen ..	890
ZDY	*b.* Corcliff	825
ZDY	*b.* Tregarth	887
ZDZ	*b.* Ocean Transport ..	864
ZEA	*b.* Queensland Transport	873
ZEC	*b.* Corcove	825
ZED	*b.* Pacific Transport ..	866
ZEE	*b.* Tasmanian Transport	885
ZEF	*b.* Derwent River ..	828
ZEG	*b.* Fraser River ..	835
ZEH	*b.* Gambia River ..	836
ZEK	*b.* Sagama River ..	877
ZEM	*b.* Orange River ..	865
ZEN	*b.* Lynton Grange ..	853
ZEP	*b.* Dolphin Shell ..	829
ZEQ	*b.* Oaklands Grange ..	864
ZER	*b.* Rounton Grange ..	876
ZES	*b.* Genesee ZES ..	781
ZET	*b.* Sunland	882
ZEV	*b.* Globe	838
ZEW	*b.* Havre	841
ZFA	*b.* Rosalind	875
ZFC	*b.* Cairnmona	815
ZFD	*b.* Graciana	839
ZFE	*b.* Monestoy	859
ZFI	*b.* Caterino	817
ZFL	*b.* Oristano	865
ZFM	*b.* Rossano	876
ZFN	*b.* Yoseric	895
ZFP	*b.* Baron Sempill ..	809
ZFT	*b.* Kaffir Prince ..	846
ZFU	*b.* Merchant Prince ..	858
ZFW	*b.* Soldier Prince ..	881
ZGB	*b.* Rhodesian Transport	874
ZGC	*b.* Malvern Range ..	854
ZGD	*b.* Briarwood	813
ZGE	*b.* Clan Macintosh ..	822
ZGG	*b.* City of Manchester	819
ZGH	*b.* Santeramo	877
ZGI	*b.* Roman Prince ..	875
ZGM	*b.* Alexandrian ..	803
ZGN	*b.* Varsova	889
ZGO	*b.* Nubian	864
ZGP	*b.* Median	857
ZGQ	*b.* Meltonian	858
ZGR	*b.* Trevisa	888
ZGS	*b.* Napierian	861
ZGU	*b.* Oranian	865
ZGW	*b.* Scythian	878
ZGZ	*b.* Hazel Branch ..	841
ZHE	*b.* Vasna	890
ZHF	*b.* City of Manila ..	819
ZHG	*b.* Acajutla	802
ZHH	*b.* Architect	805
ZHJ	*b.* Dibble Bridge ..	829
ZHK	*b.* Vennachar	890
ZHL	*b.* Catalina ZHL ..	817
ZHM	*b.* Conway	825
ZHO	*b.* Teviot	885
ZHP	*b.* Glenspey	838
ZHS	*b.* Clan Chattan ..	820
ZHT	*b.* Clan Macbride ..	821
ZHU	*b.* Clan Robertson ..	824
ZHV	*b.* Clan Macdonald ..	821
ZHW	*b.* Dryden	830
ZHX	*b.* Elswick House ..	832
ZHY	*b.* Siddons	879
ZHZ	*b.* Socrates	880
ZIA	*b.* Lady Rhondda ..	849
ZIB	*b.* Plutarch	869
ZIC	*b.* Tamarac	885
ZIH	*b.* Sea Serpent ..	879
ZII	*b.* Rhesus	874
ZIK	*b.* Glenelg	837
ZIL	*b.* Patani	867
ZIN	*b.* Volga	891
ZIO	*b.* Buchanness ..	814
ZIR	*b.* Sellasia	879
ZIS	*b.* Cloutsham	824
ZIT	*b.* River Araxes ..	875
ZIV	*b.* Maple Branch ..	856
ZIZ	*b.* Polgowan	869
ZJA	*b.* Seattle	879
ZJB	*b.* Ariosto	806
ZJC	*b.* Domingo de Larrinaga	829
ZJD	*b.* Bournemouth ..	811
ZJE	*b.* Chipana	818
ZJF	*b.* Quantock	872
ZJG	*b.* Sutton Hall ..	883
ZJH	*b.* Warcuta	892
ZJK	*b.* Agamemnon ZJK ..	802
ZJM	*b.* Tydeus	888
ZJN	*b.* Pak Ling	866
ZJO	*b.* Pinemoor	869
ZJP	*b.* Agapenor	802
ZJQ	*b.* Alcinous	803
ZJS	*b.* Hector	841
ZJT	*b.* Helenus	841
ZJX	*b.* Aylestone	807
ZJZ	*b.* Teiresias	885
ZKA	*b.* Telamon	885
ZKC	*b.* Tyndareus	888
ZKD	*b.* Elpenor	832
ZKF	*b.* Astyanax	807
ZKG	*b.* Atreus	807
ZKH	*b.* Demodocus	828
ZKI	*b.* Hyson	844
ZKK	*b.* Myrmidon	861
ZKL	*b.* Neleus	862
ZKO	*b.* Yang Tsze ..	895
ZKP	*b.* Keemun	847
ZKQ	*b.* Dominic	829

		PAGE
ZKR	b. Tuscany	888
ZKS	b. Aberdonian ..	801
ZKT	b. Carrigan Head ..	816
ZKU	b. Mytilus	861
ZKV	b. Valacia	889
ZKW	b. Glengyle	837
ZKY	b. Benedict	810
ZLA	b. Chancellor	817
ZLB	b. Glenavy	837
ZLC	b. Blackwell	811
ZLE	b. Dunstan	830
ZLF	b. Capelhall	815
ZLH	b. Highland Star ..	842
ZLJ	b. Ekaterinoslav ZLJ	831
ZLK	b. British Emperor ..	813
ZLL	b. Intombi	845
ZLM	b. Voronej	891
ZLO	b. Oliva	864
ZLP	b. Glenamoy	837
ZLQ	b. Kerman	848
ZLR	b. Italian	845
ZLR	b. Rollo	875
ZLS	b. Cutcombe	827
ZLT	b. Port Elliot	870
ZLU	b. Port Sydney ..	871
ZLV	b. Figuig	834
ZLX	b. F. A. Tamplin ..	833
ZLY	b. Tartar Prince ..	885
ZLZ	b. Chama	817
ZMA	b. Arabistan	805
ZMB	b. Prahsu	871
ZME	b. Bendu	810
ZMF	b. Benue	811
ZMH	b. Polladern	869
ZMI	b. Shanga	879
ZMJ	b. Bassam	809
ZMK	b. Gaboon	835
ZMM	b. Onitsha	865
ZMP	b. Zaria	895
ZMQ	b. Benguela	811
ZMR	b. Benin	811
ZMS	b. Kaduna	846
ZMT	b. Kwarra	849
ZMU	b. Salaga	877
ZMV	b. Eburna	831
ZMW	b. Cowrie	826
ZNA	b. Turbo	888
ZNB	b. Barima	808
ZNC	b. Manchester Spinner	855
ZND	b. Maplemore	856
ZNF	b. Gambada	836
ZNG	b. Vedic	890
ZNH	b. Manchester Producer	855
ZNI	b. Raranga	873
ZNJ	b. Hartside	841
ZNL	b. Donax	829
ZNM	b. Tintoretto	886
ZNN	b. Gordon Castle ..	838
ZNO	b. Hindustan	843
ZNP	b. Tritonia	888
ZNR	c. Kebkebia	628
ZNR	b. Falls City	834
ZNS	b. Niceto de Larrinaga	863
ZNU	b. Tanfield	885
ZNX	b. Karagola	847
ZNZ	b. Port Napier ..	871
ZOA	b. Tambov	885
ZOB	b. Cromer	827
ZOD	b. Regina ZOD ..	874
ZOE	b. Newby Hall ..	862

		PAGE
ZOF	b. Manchester Shipper	855
ZOG	b. Novgorod ZOG ..	864
ZOH	b. Largo Law	850
ZOI	b. Albanian	803
ZOK	b. Yaroslavl	895
ZOL	b. Sheaf Don	879
ZOP	b. Romeo	675
ZOQ	b. Baron Renfrew ..	809
ZOS	b. Rotterdam ZOS ..	876
ZOV	b. Quentin	873
ZOW	b. Jervaulx Abbey ..	846
ZOX	b. Glenlyon	837
ZOY	b. Grace Dollar ..	839
ZPC	b. Nascopie	861
ZPD	b. Port Lyttleton ..	871
ZPE	b. Cornish Point ..	826
ZPF	b. Aldworth	803
ZPG	b. Roumelian	876
ZPJ	b. Freienfels	835
ZPL	b. Pennyworth ..	868
ZPN	b. Clan Stuart ..	824
ZPP	b. Baron Elcho ..	809
ZPQ	b. Warrior	892
ZPR	b. Barotse	809
ZPT	b. Griqua	840
ZPU	b. Amatonga	803
ZPW	b. Longnewton ..	851
ZPX	b. Unio	889
ZQA	b. Baronesa	809
ZQC	b. Duquesa	830
ZQD	b. Marquesa	856
ZQE	b. Princesa	872
ZQG	b. Euclid	833
ZQH	b. Sallust	877
ZQI	b. Virgil	891
ZQJ	b. Duffield	830
ZQK	b. Clan Malcolm ..	823
ZQL	b. Manchester Merchant	855
ZQN	b. Manchester Port ..	855
ZQQ	b. Alesia	803
ZQR	b. Umvuma	889
ZQS	b. Banchory	808
ZQT	b. Nawab	862
ZQU	b. Huntscastle ..	844
ZQV	b. Manchester Civilian	854
ZQW	b. Manchester Exchange ..	855
ZQX	b. Ashwin	806
ZQY	b. Manchester Importer.. ..	855
ZQZ	b. Manchester Mariner	855
ZRA	b. Larne	850
ZRB	b. Kingsmere	848
ZRC	b. Dotterel	829
ZRF	b. Eden Hall	831
ZRG	b. Red Cap	873
ZRH	b. Clemenceau ..	824
ZRI	b. Baron Cathcart ..	809
ZRJ	b. Roath	875
ZRK	b. Strathfillan.. ..	882
ZRM	b. Sanday	877
ZRN	b. Reindeer ZRN ..	874
ZRP	b. War Jandoli ..	892
ZRR	b. Scottier	878
ZRS	b. Anglo-Chilean ..	804
ZRT	b. Mendip Range ..	858
ZRU	b. Cosmos Volga ..	826
ZRV	b. Katie	847
ZRW	b. Queen Margaret ..	873
ZRX	b. Lowther Castle ..	852

		PAGE
ZRY	b. Royal George ZRY	876
ZRZ	b. Royalstar	876
ZSA	b. Clan Murdoch ..	823
ZSH	b. Chatham	817
ZSI	b. Ethelaida	833
ZSJ	b. Llanberis	851
ZSK	b. North Pacific ..	863
ZSL	b. Eider	831
ZSN	b. Pentakota	868
ZSP	b. Pundua	872
ZSQ	b. Palitana	866
ZSR	b. Virawa	890
ZSU	b. Port Stephens ..	871
ZSV	b. Port Pirie	871
ZSW	b. Port Melbourne ..	871
ZSZ	b. Laomedon	850
ZTA	b. Polglass Castle ..	869
ZTB	b. Theseus	886
ZTC	b. Media	857
ZTD	b. Inverawe	845
ZTE	b. Eboe	831
ZTF	b. Princess Victoria ZTF	872
ZTH	b. Abbassieh	801
ZTI	b. Siberian Prince ..	879
ZTJ	b. Royal Scot	876
ZTL	b. Redgate	874
ZTQ	b. Huntspill	844
ZTR	b. S. Pablo	884
ZTT	b. Navarino	861
ZTU	b. Bavarian	809
ZTW	b. Trefusis	887
ZTX	b. Highmead	842
ZTY	b. Cape Ortegal ..	816
ZTZ	b. Carlo Victoria ..	816
ZUD	b. Soroka	881
ZUE	b. Alert ZUE	803
ZUF	b. Trehawke	887
ZUG	b. Tapton	885
ZUH	b. Trevethoe	887
ZUI	b. Trecarne	887
ZUK	b. Shannonmede ..	879
ZUL	b. Athenic ZUL ..	807
ZUN	b. Orient City.. ..	865
ZUR	b. Foyle ZUR.. ..	835
ZUT	b. Ikala	844
ZUW	b. Grelcaldy	839
ZUY	b. Boyne	813
ZUZ	b. Cardiff Hall ..	816
ZVB	b. Lord Sefton ..	851
ZVC	b. Glennevis	837
ZVE	b. Amberton	803
ZVF	b. Aral	805
XVH	b. Nurtureton.. ..	864
ZVI	b. Appleleaf	805
ZVJ	b. Middleham Castle ..	859
ZVL	b. Lord Byron ..	851
ZVM	b. Hornby Castle ..	843
ZVT	b. Vigo..	890
ZVU	b. Aleppo	803
ZVV	b. Morocco	860
ZVW	b. Agnes Duncan ..	802
XVX	b. Zamora	895
ZVY	b. Baygowan	809
ZVZ	b. Baycross	809
ZWA	b. Poltolia	869
ZWC	b. Seapool	878
ZWD	b. Comedian	825
ZWF	b. Quito	873
ZWG	b. Frances Duncan ..	835

		PAGE
ZWH	b. Madras City ..	853
ZWJ	b. J. Duncan ..	845
ZWL	b. Fishpool	834
ZWN	b. Eastwood	831
ZWP	b. Lucellum	852
ZWQ	b. Fieldmarshal ..	834
ZWS	b. Hartlepool	841
ZWU	b. Penrose	868
ZWV	b. Yonne	895
ZWX	b. Trident ZWX ..	858
ZWY	b. Waddon	891
ZWZ	b. Poland	869
ZXA	b. Zingara	895
ZXB	b. Helmsloch	841
ZXC	b. Belgic	810
ZXG	b. Student	882
ZXH	b. Hesleyside	842
ZXI	b. Farnworth	834
ZXJ	b. Parthenia	867
ZXK	b. Clan Macmaster ..	822
ZXL	b. Batsford	809
ZXM	b. Doonholm	829
ZXN	b. Penmorvah.. ..	867
ZXO	b. Gaelicstar	835
ZXP	b. Ionicstar	845
ZXQ	b. Celticstar	817
ZXR	b. Normanstar ..	863
ZXS	b. Fotinia	835
ZXT	b. Hamm	840
ZXU	b. Hollinside	842
ZXV	b. Molesey	859
ZXW	b. Baygola	809
ZXX	b. Bayverdun ..	810
ZYA	b. Hannah	841
ZYC	b. Everilda	833
ZYD	b. Kassala	847
ZYF	b. Parktown	867
ZYG	b. Sea Glory	878
ZYH	b. Ismailia	845
ZYI	b. Hunsgate	843
ZYK	b. Petroleine	869
ZYM	b. Greystoke Castle ..	840
ZYO	b. Newlands	862
ZYP	b. Somersby	881
ZYQ	b. Swainby	883
ZYT	b. British Princess ..	814
ZYU	b. British Sovereign ..	814
ZYV	b. British Ensign ..	813
ZYW	b. British Isles ..	813
ZYY	b. British Admiral ..	813
ZYZ	b. British Empress ..	813
ZZA	b. Bencleuch	810
ZZB	b. General Allenby ..	836
ZZC	b. Pennard	868
ZZD	b. Matra	857
ZZE	b. Massis	857
ZZF	b. Pendragon Castle ..	867
ZZG	b. Laurel Branch ..	850
ZZI	b. Grelwen	839
ZZL	b. Cypria	827
ZZM	b. Plumleaf	869
ZZN	b. Cherryleaf	818
ZZO	b. Pearleaf	867
ZZP	b. Orangeleaf	865
ZZQ	b. Brambleleaf ..	813
ZZR	b. Aragaz	805
ZZS	b. Hyrcania	844
ZZV	b. Pavia	867
ZZW	b. Tyria	880
ZZX	b. Torrent	887

METEOROLOGICAL SECTION

INTERNATIONAL TIME AND WEATHER SIGNALS.

CURRENT ARRANGEMENTS.

THE meteorological observations sent by wireless are mainly in the old International Code given below. Variations from it are noted under each country which departs from it in any particular.

OLD INTERNATIONAL CODE.

The standard group is represented symbolically by :

BBBDD FWTTC βbbRR MMmmu

Where BBB = barometric pressure in tenths of mm. (the first figure 7 is omitted) reduced to sea-level and corrected for gravity.* If the barometer reading is given in inches, the initial 2 or 3 is usually omitted and the values given to the nearest hundredth. If expressed in millibars and tenths the initial 9 or 10 is omitted. Readings in millimetres can be expressed in millibars by adding ⅓ – *e.g.*, 760 mm. = 760 + ⅓ (760) = 760 + 253.3 = 1013.3 mb.

Similarly, readings in millibars can be expressed in millimetres by taking ¾ of the value—*e.g.*, 1000 mb. = ¾ (1000) mm. = 750 mm.

DD = direction of the wind according to the following code unless otherwise specified :—

02 =	N.N.E.	18 =	S.S.W.
04 =	N.E.	20 =	S.W.
06 =	E.N.E.	22 =	W.S.W.
08 =	E.	24 =	W.
10 =	E.S.E.	26 =	W.N.W.
12 =	S.E.	28 =	N.W.
14 =	S.S.E.	30 =	N.N.W.
16 =	S.	32 =	N.

For calm the figures 00 are used.

F = strength of the wind on Beaufort Scale (see pp. 1128 and 1129).

For forces greater than 9 a special note is usually added at the end of message.

W = state of sky by following code :

0 = sky cloudless—fine.
1 = sky quarter covered.
2 = sky half covered.
3 = sky three-quarter covered.
4 = overcast.
5 = rain.
6 = snow.
7 = mist (not *wet* fog, but fog less thick than for 8).
8 = fog.
9 = thunderstorm.

* This reduction is necessary in order to place the results upon a comparable basis. The complete corrections necessary are (1) *index-error* (given on the certificate of verification) to compensate errors in calibration. N.B. With a Fortin type barometer, the correction will be the same throughout the scale ; with the Kew pattern it will probably differ in different parts of the scale. (2) Sea-level (see tables below). (3) Temperature. (4) Gravity (see tables below) reduced to lat. 45°.

TT = temperature in whole degrees Centigrade. 50 is added to the number when the temperature is negative.

C = direction of motion of upper-clouds (cirrus and cirro-stratus).

0 = clouds with no appreciable movement.
1 = ,, from N.E.
2 = ,, ,, E.
3 = ,, ,, S.E.
4 = ,, ,, S.
5 = clouds from S.W.
6 = ,, ,, W.
7 = ,, ,, N.W.
8 = ,, ,, N.
9 = no observation.

β = characteristic of barometric tendency.*

Figures characterising the change of pressure during the 3 hours preceding the observation :—

	Old Scale.	*New Scale.*
0 =	barometer steady.	steady or rising.
1 =	,, unsteady.	rising, then steady.
2 =	,, rising.	rising, then falling.
3 =	,, falling.	falling or steady, then rising.
4 =	,, falling, then rising.	unsteady, but rising.
5 =	,, steady, then rising.	falling.
6 =	,, steady, then falling.	falling, then steady.
7 =	,, falling, then steady.	falling, then rising.
8 =	,, rising, then steady or falling.	steady or rising, then falling.
9 =	line squall.	unsteady, but falling.

bb = tendency in tenths of mm. 50 is added to the wind direction if the tendency is negative.

RR = rainfall in mm. in the past 24 hours.

MM = maximum temperature } from 7h. of the preceding day to 7h. of
mm = minimum ,, } the day of observation.

u = sea disturbance.
0 = sea calm.
1 = ,, very smooth.
2 = ,, smooth rippled.
3 = ,, slight rippled.
4 = ,, moderate furrowed.
5 = sea rather rough, much furrowed.
6 = ,, rough, deeply furrowed.
7 = ,, high, rollers.
8 = ,, very high rollers.
9 = ,, phenomenal.

W[1] = characteristic of past weather sent at the end of the second group in place of C in 18h. messages.

0 = mainly fine.
1 = fair.
2 = mainly overcast.
3 = sheet lightning.
4 = precipitation, mainly during forenoon.
5 = precipitation, mainly during afternoon.
6 = mainly foggy.
7 = thunderstorm.
8 = passing showers.
9 = persistent precipitation.

HOURLY WEATHER REPORTS.

(See Great Britain.)

The New International Code for hourly weather reports is given under Great Britain (q.v.).

* A cyclone or anti-cyclone seldom travels unchanged in shape and intensity, and the travel of pressure-change is more regular than that of pressure-value. The barometric tendency therefore gives a general idea of the changes of pressure that are in progress.

ROUTE WEATHER REPORTS.

The following code is used for route weather reports.

Station numbers DDFD_1F_1, ALaNh wwWVV BBBKc Cddvv, where

- DD = direction of wind (Scale 0-32).
- F = force of wind on Beaufort scale.
- D_1 = direction of motion of low cloud (2 = E, 4 = S, 6 = W, 8 = N).
- F_1 = speed of low cloud (Code 1).
- A = form of low cloud (Code 2).
- L = amount of low cloud (in tenths of sky covered).
- a = form of high cloud (Code 2).
- N = amount of total cloud in tenths.
- h = height of base of low cloud (Code 3).
- ww = present weather (Code 4).
- W = weather 3 hours preceding (Code 5).
- V = visibility (Code 6).
- V_s = visibility to sea (Code 6).
- BBB = barometer in tenths of mm.
- K = state of sea (Code 7).
- c = characteristic of barometric tendency (Code 8).
- C = cloud of greatest amount (Code 2).
- dd = direction from where these clouds are coming (01 = 10° = N. 10° E, 07 = 70° = N. 70° E.; 13 = 130° = S. 50° E.).
- vv = speed of these clouds per hour in kilometres.

Code 1 = speed of low cloud = F_1

0 = no motion.
1 = 1– 14 km. per hour (1– 4 m. per sec.)
2 = 15– 28 „ „ „ (4– 8 „ „ „)
3 = 29– 42 „ „ „ (8–12 „ „ „)
4 = 43– 57 „ „ „ (12–16 „ „ „)
5 = 58– 72 „ „ „ (16–20 „ „ „)
6 = 73– 86 „ „ „ (20–24 „ „ „)
7 = 87–101 „ „ „ (24–28 „ „ „)
8 = 102–115 „ „ „ (28–32 „ „ „)
9 = more than 115 km. per hour (more than 32 m. per sec.)

Code 2 = forms of cloud = A, a, C.

1 = Cirrus (Ci).
2 = Cirro-stratus (Ci-St).
3 = Cirro-cumulus (Ci-Cu).
4 = Alto-cumulus (A-Cu).
5 = Alto-stratus (A-st).
6 = Strato-cumulus (St-Cu).
7 = Nimbus (Nb)
8 = Cumulus (Cu)
9 = Cumulo-Nimbus (Cu-Nb).
0 = Stratus (St).

Code 3 = height of base of low cloud = h.

0 = base of cloud under 50 m.
1 = „ „ „ at 50 100 m.
2 = „ „ „ „ 100– 200 m.
3 = „ „ „ „ 200– 300 m.
4 = „ „ „ „ 300– 600 m.
5 = „ „ „ „ 600–1000 m.
6 = „ „ „ „ 1000–1500 m.
7 = „ „ „ „ 1500–2000 m.
8 = „ „ „ „ 2000–2500 m.
9 = „ „ „ „ above 2500 m.

Code 4 = present weather = ww.

0 = fine, cloudless	0 = cloud decreasing. 1 = no change in cloud. 2 = cloud increasing. 3 = visibility more than 50 km. 4 = circle round sun or moon.
1 = very cloudy	5 = after mist or haziness. 6 = after rain or drizzle. 7 = after snow or wet snow. 8 = during or after thunderstorm. 9 = after thunderstorm.
2 = haziness or fog	0 = clear in zenith, just begun. 1 = overcast, just begun. 2 = clear in zenith, at intervals. 3 = overcast, at intervals. 4 = clear in zenith } since some time, 5 = overcast } becoming clearer. 6 = clear in zenith, since some time. 7 = overcast, since some time. 8 = clear in zenith } since some time, 9 = overcast } becoming thicker.
3 = showers at intervals	0 = with light rain. 1 = ,, hail, or hail and rain. 2 = ,, wet snow. 3 = ,, snow. 4 = ,, rain, decreasing. 5 = with heavy rain. 6 = ,, rain, increasing. 7 = ,, hail, or hail and rain. 8 = ,, wet snow. 9 = ,, snow.
4 = drizzle .... 5 = rain .... 6 = snow, or snow and hail .... 7 = wet snow or rain and snow .... 8 = hail or rain and hail	0 = light at intervals. 1 = ,, constantly. 2 = ,, increasing. 3 = ,, decreasing. 4 = moderate at intervals. 5 = ,, constantly. 6 = ,, increasing. 7 = ,, decreasing. 8 = heavy at intervals. 9 = ,, constantly.
9 = thunderstorm (heavy shower)	0 = light, without hail. 1 = ,, with hail. 2 = moderate, without hail. 3 = ,, with hail. 4 = heavy without hail. 5 = ,, with hail. 6 = ,, with storm. 7 = ,, with hail and storm. 8 = ,, shower without hail. 9 = ,, ,, with hail.

Code 5 = weather 3 hours preceding = W.

0 = clear, cloudless, without rain or snow.
1 = very cloudy, ,, ,, ,,
2 = constantly clouded, ,, ,, ,,
3 = haziness or fog, ,, ,, ,,
4 = thick fog, ,, ,, ,,

(*Continued on page* 1132.)

SPECIFICATION OF THE BEAUFORT SCALE WITH

Beaufort Number.	Admiral Beaufort's General Description of Wind.	Admiral Beaufort's Specification, 1805.		Description of Wind.	Mode of Estimating aboard Sailing Vessels.
0	Calm	Calm		—	—
1	Light air ..	Just sufficient to give steerage way.		Light breeze	Sufficient wind for working ship.
2	Slight breeze	That in which a well-conditioned man-of-war, with all sail set and "clean full," would go in smooth water from	1 to 2 knots.	Light breeze	Sufficient wind for working ship.
3	Gentle breeze		3 to 4 knots.	Light breeze	Sufficient wind for working ship.
4	Moderate breeze		5 to 6 knots.	Moderate breeze	Forces most advantageous for sailing with leading wind and all sail drawing.
5	Fresh breeze	That to which she could just carry in chase "full and by."	Royals, etc.	Moderate breeze	Forces most advantageous for sailing with leading wind and all sail drawing.
6	Strong breeze		Single-reefed topsails or top-gallant sails.	Strong wind	Reduction of sail necessary with leading wind.
7	Moderate gale (*High Wind*)		Double-reefed topsails, jib, etc.	Strong wind	Reduction of sail necessary with leading wind.
8	Fresh gale .. (*Gale*)		Triple-reefed topsails, etc.	Gale forces	Considerable reduction of sail necessary even with wind quartering.
9	Strong gale ..		Close-reefed topsails and courses.	Gale forces	Considerable reduction of sail necessary even with wind quartering.
10	Whole gale ..	That with which she could scarcely bear close-reefed main topsail and reefed foresail.		Storm forces	Close reefed sail running, or hove to under storm sail.
11	Storm ..	That which would reduce her to storm stay-sails.		Storm forces	Close reefed sail running, or hove to under storm sail.
12	Hurricane ..	That which no canvas could withstand.		Hurricane ..	No sail can stand even when running.

* It has been decided that for statistical purposes winds of force less than 8 shall not be counted as gales, and to avoid the ambiguity implied by the use of the term "moderate gale" for force 7 the Beaufort description has been modified by the substitution of the descriptions in italics for forces 7 and 8.

EQUIVALENTS OF THE NUMBERS OF THE SCALE.

Beaufort Number.	Specification of Beaufort Scale. For Coast Use.	Specification of Beaufort Scale. For Use on Land.	Mean wind force in lb. per sq. ft. at standard density.	Equivalent velocity in miles per hour.	Limits of Velocity.
0	Calm	Calm; smoke rises vertically.	0	0	Less than 1
1	Fishing smack * just has steerage way.	Direction of wind shown by smoke drift, but not by wind vanes.	·01	2	1–3
2	Wind fills the sails of smacks, which then move at about 1–2 miles per hour.	Wind felt on face; leaves rustle; ordinary vane moved by wind.	·08	5	4–7
3	Smacks begin to careen, and travel about 3–4 miles per hour.	Leaves and small twigs in constant motion; wind extends light flag.	·28	10	8–12
4	Good working breeze; smacks carry all canvas, with good list.	Raises dust and loose paper; small branches are moved.	·67	15	13–18
5	Smacks shorten sail ..	Small trees in leaf begin to sway; crested wavelets form on inland waters.	1·31	21	19–24
6	Smacks have double reef in main sail. Care required when fishing.	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty.	2·3	27	25–31
7	Smacks remain in harbour, and those at sea lie to.	Whole trees in motion; inconvenience felt when walking against wind.	3·6	35	32–38
	All smacks make for harbour, if near.	Breaks twigs off trees; generally impedes progress.	5·4	42	39–46
9	—	Slight structural damage occurs (chimney pots and slates removed).	7·7	50	47–54
10	—	Seldom experienced inland; trees uprooted; considerable structural damage occurs.	10·5	59	55–63
11	—	Very rarely experienced; accompanied by widespread damage.	14·0	68	64–75
12	—	—	Above 17·0	Above 75	Above 75

* The fishing smack in this column may be taken as representing a trawler of average type and trim. For larger or smaller boats and for special circumstances allowance must be made.

Table I.—Temperature. ***Degrees Absolute to Degrees Fahrenheit.***

The equations are $A = 273 + \frac{5}{9}(F - 32)$, $F = 32 + \frac{9}{5}(A - 273)$.

Degrees Absolute.	0	1	2	3	4	5	6	7	8	9
	Degrees Fahrenheit.									
250	−9.4	−9.2	−9.0	−8.9	−8.7	−8.5	−8.3	−8.1	−8.0	−7.8
251	−7.6	−7.4	−7.2	−7.1	−6.9	−6.7	−6.5	−6.3	−6.2	−6.0
252	−5.8	−5.6	−5.4	−5.3	−5.1	−4.9	−4.7	−4.5	−4.4	−4.2
253	−4.0	−3.8	−3.6	−3.5	−3.3	−3.1	−2.9	−2.7	−2.6	−2.4
254	−2.2	−2.0	−1.8	−1.7	−1.5	−1.3	−1.1	−0.9	−0.8	−0.6
255	−0.4	−0.2	0.0	+0.1	+0.3	+0.5	+0.7	+0.9	+1.0	+1.2
256	+1.4	+1.6	+1.8	1.9	2.1	2.3	2.5	2.7	2.8	3.0
257	3.2	3.4	3.6	3.7	3.9	4.1	4.3	4.5	4.6	4.8
258	5.0	5.2	5.4	5.5	5.7	5.9	6.1	6.3	6.4	6.6
259	6.8	7.0	7.2	7.3	7.5	7.7	7.9	8.1	8.2	8.4
260	8.6	8.8	9.0	9.1	9.3	9.5	9.7	9.9	10.0	10.2
261	10.4	10.6	10.8	10.9	11.1	11.3	11.5	11.7	11.8	12.0
262	12.2	12.4	12.6	12.7	12.9	13.1	13.3	13.5	13.6	13.8
263	14.0	14.2	14.4	14.5	14.7	14.9	15.1	15.3	15.4	15.6
264	15.8	16.0	16.2	16.3	16.5	16.7	16.9	17.1	17.2	17.4
265	17.6	17.8	18.0	18.1	18.3	18.5	18.7	18.9	19.0	19.2
266	19.4	19.6	19.8	19.9	20.1	20.3	20.5	20.7	20.8	21.0
267	21.2	21.4	21.6	21.7	21.9	22.1	22.3	22.5	22.6	22.8
268	23.0	23.2	23.4	23.5	23.7	23.9	24.1	24.3	24.4	24.6
269	24.8	25.0	25.2	25.3	25.5	25.7	25.9	26.1	26.2	26.4
270	26.6	26.8	27.0	27.1	27.3	27.5	27.7	27.9	28.0	28.2
271	28.4	28.6	28.8	28.9	29.1	29.3	29.5	29.7	29.8	30.0
272	30.2	30.4	30.6	30.7	30.9	31.1	31.3	31.5	31.6	31.8
273	32.0	32.2	32.4	32.5	32.7	32.9	33.1	33.3	33.4	33.6
274	33.8	34.0	34.2	34.3	34.5	34.7	34.9	35.1	35.2	35.4
275	35.6	35.8	36.0	36.1	36.3	36.5	36.7	36.9	37.0	37.2
276	37.4	37.6	37.8	37.9	38.1	38.3	38.5	38.7	38.8	39.0
277	39.2	39.4	39.6	39.7	39.9	40.1	40.3	40.5	40.6	40.8
278	41.0	41.2	41.4	41.5	41.7	41.9	42.1	42.3	42.4	42.6
279	42.8	43.0	43.2	43.3	43.5	43.7	43.9	44.1	44.2	44.4
280	44.6	44.8	45.0	45.1	45.3	45.5	45.7	45.9	46.0	46.2
281	46.4	46.6	46.8	46.9	47.1	47.3	47.5	47.7	47.8	48.0
282	48.2	48.4	48.6	48.7	48.9	49.1	49.3	49.5	49.6	49.8
283	50.0	50.2	50.4	50.5	50.7	50.9	51.1	51.3	51.4	51.6
284	51.8	52.0	52.2	52.3	52.5	52.7	52.9	53.1	53.2	53.4
285	53.6	53.8	54.0	54.1	54.3	54.5	54.7	54.9	55.0	55.2
286	55.4	55.6	55.8	55.9	56.1	56.3	56.5	56.7	56.8	57.0
287	57.2	57.4	57.6	57.7	57.9	58.1	58.3	58.5	58.6	58.8
288	59.0	59.2	59.4	59.5	59.7	59.9	60.1	60.3	60.4	60.6
289	60.8	61.0	61.2	61.3	61.5	61.7	61.9	62.1	62.2	62.4
290	62.6	62.8	63.0	63.1	63.3	63.5	63.7	63.9	64.0	64.2
291	64.4	64.6	64.8	64.9	65.1	65.3	65.5	65.7	65.8	66.0
292	66.2	66.4	66.6	66.7	66.9	67.1	67.3	67.5	67.6	67.8
293	68.0	68.2	68.4	68.5	68.7	68.9	69.1	69.3	69.4	69.6
294	69.8	70.0	70.2	70.3	70.5	70.7	70.9	71.1	71.2	71.4
295	71.6	71.8	72.0	72.1	72.3	72.5	72.7	72.9	73.0	73.2
296	73.4	73.6	73.8	73.9	74.1	74.3	74.5	74.7	74.8	75.0
297	75.2	75.4	75.6	75.7	75.9	76.1	76.3	76.5	76.6	76.8
298	77.0	77.2	77.4	77.5	77.7	77.9	78.1	78.3	78.4	78.6
299	78.8	79.0	79.2	79.3	79.5	79.7	79.9	80.1	80.2	80.4
300	80.6	80.8	81.0	81.1	81.3	81.5	81.7	81.9	82.0	82.2
301	82.4	82.6	82.8	82.9	83.1	83.3	83.5	83.7	83.8	84.0
302	84.2	84.4	84.6	84.7	84.9	85.1	85.3	85.5	85.6	85.8
303	86.0	86.2	86.4	86.5	86.7	86.9	87.1	87.3	87.4	87.6
304	87.8	88.0	88.2	88.3	88.5	88.7	88.9	89.1	89.2	89.4
305	89.6	89.8	90.0	90.1	90.3	90.5	90.7	90.9	91.0	91.2
306	91.4	91.6	91.8	91.9	92.1	92.3	92.5	92.7	92.8	93.0
307	93.2	93.4	93.6	93.7	93.9	94.1	94.3	94.5	94.6	94.8
308	95.0	95.2	95.4	95.5	95.7	95.9	96.1	96.3	96.4	96.6
309	96.8	97.0	97.2	97.3	97.5	97.7	97.9	98.1	98.2	98.4
310	98.6	98.8	99.0	99.1	99.3	99.5	99.7	99.9	100.0	100.2

The following table enables inches of mercury to be put into millibars and *vice versa* :—

TABLE II.—PRESSURE.

Equivalents in Millibars of Inches of Mercury at 32° F. Lat. 45°.

Inches.	0	1	2	3	4	5	6	7	8	9
	Millibars.									
27·0	914·3	914·6	915·0	915·3	915·7	916·0	916·3	916·7	917·0	917·4
27·1	917·7	918·0	918·4	918·7	919·0	919·4	919·7	920·1	920·4	920·7
27·2	921·1	921·4	921·8	922·1	922·4	922·8	923·1	923·4	923·8	924·1
27·3	924·5	924·8	925·1	925·5	925·8	926·2	926·5	926·8	927·2	927·5
27·4	927·9	928·2	928·5	928·9	929·2	929·5	929·9	930·2	930·6	930·9
27·5	931·2	931·6	931·9	932·3	932·6	932·9	933·3	933·6	933·9	934·3
27·6	934·6	935·0	935·3	935·6	936·0	936·3	936·7	937·0	937·3	937·7
27·7	938·0	938·3	938·7	939·0	939·4	939·7	940·0	940·4	940·7	941·1
27·8	941·4	941·7	942·1	942·4	942·8	943·1	943·4	943·8	944·1	944·4
27·9	944·8	945·1	945·5	945·8	946·1	946·5	946·8	947·2	947·5	947·8
28·0	948·2	948·5	948·8	949·2	949·5	949·9	950·2	950·5	950·9	951·2
28·1	951·6	951·9	952·2	952·6	952·9	953·2	953·6	953·9	954·3	954·6
28·2	954·9	955·3	955·6	956·0	956·3	956·6	957·0	957·3	957·7	958·0
28·3	958·3	958·7	959·0	959·3	959·7	960·0	960·4	960·7	961·0	961·4
28·4	961·7	962·1	962·4	962·7	963·1	963·4	963·7	964·1	964·4	964·8
28·5	965·1	965·4	965·8	966·1	966·5	966·8	967·1	967·5	967·8	968·1
28·6	968·5	968·8	969·2	969·5	969·8	970·2	970·5	970·9	971·2	971·5
28·7	971·9	972·2	972·6	972·9	973·2	973·6	973·9	974·2	974·6	974·9
28·8	975·3	975·6	975·9	976·3	976·6	977·0	977·3	977·6	978·0	978·3
28·9	978·6	979·0	979·3	979·7	980·0	980·3	980·7	981·0	981·4	981·7
29·0	982·0	982·4	982·7	983·0	983·4	983·7	984·1	984·4	984·7	985·1
29·1	985·4	985·8	986·1	986·4	986·8	987·1	987·5	987·8	988·1	988·5
29·2	988·8	989·1	989·5	989·8	990·2	990·5	990·8	991·2	991·5	991·9
29·3	992·2	992·5	992·9	993·2	993·5	993·9	994·2	994·6	994·9	995·2
29·4	995·6	995·9	996·3	996·6	996·9	997·3	997·6	997·9	998·3	998·6
29·5	999·0	999·3	999·6	1000·0	1000·3	1000·7	1001·0	1001·3	1001·7	1002·0
29·6	1002·4	1002·7	1003·0	1003·4	1003·7	1004·0	1004·4	1004·7	1005·1	1005·4
29·7	1005·7	1006·1	1006·4	1006·8	1007·1	1007·4	1007·8	1008·1	1008·4	1008·8
29·8	1009·1	1009·5	1009·8	1010·1	1010·5	1010·8	1011·2	1011·5	1011·8	1112·2
29·9	1012·5	1012·8	1013·2	1013·5	1013·9	1014·2	1014·5	1014·9	1015·2	1015·6
30·0	1015·9	1016·2	1016·6	1016·9	1017·3	1017·6	1017·9	1018·3	1018·6	1018·9
30·1	1019·3	1019·6	1020·0	1020·3	1020·6	1021·0	1021·3	1021·7	1022·0	1022·3
30·2	1022·7	1023·0	1023·3	1023·7	1024·0	1024·4	1024·7	1025·0	1025·4	1025·7
30·3	1026·1	1026·4	1026·7	1027·1	1027·4	1027·7	1028·1	1028·4	1028·8	1029·1
30·4	1029·4	1029·8	1030·1	1030·5	1030·8	1031·1	1031·5	1031·8	1032·2	1032·5
30·5	1032·8	1033·2	1033·5	1033·8	1034·2	1034·5	1034·9	1035·2	1035·5	1035·9
30·6	1036·2	1036·6	1036·9	1037·2	1037·6	1037·9	1038·2	1038·6	1038·9	1039·3
30·7	1039·6	1039·9	1040·3	1040·6	1041·0	1041·3	1041·6	1042·0	1042·3	1042·6
30·8	1043·0	1043·3	1043·7	1044·0	1044·3	1044·7	1045·0	1045·4	1045·7	1046·0
30·9	1046·4	1046·7	1047·1	1047·4	1047·7	1048·1	1048·4	1048·7	1049·1	1049·4
31·0	1049·8	1050·1	1050·4	1050·8	1051·1	1051·5	1051·8	1052·1	1052·5	1052·8
31·1	1053·1	1053·5	1053·8	1054·2	1054·5	1054·8	1055·2	1055·5	1055·9	1056·2
31·2	1056·5	1056·9	1057·2	1057·5	1057·9	1058·2	1058·6	1058·9	1059·2	1059·6
31·3	1059·9	1060·3	1060·6	1060·9	1061·3	1061·6	1062·0	1062·3	1062·6	1063·0
31·4	1063·3	1063·6	1064·0	1064·3	1064·7	1065·0	1065·3	1065·7	1066·0	1066·4

Thousandths of an Inch.

Inch	·001	·002	·003	004	·005	·006	·007	·008	·009
Millibars.	·0	·1	·1	·1	·2	·2	·2	·3	·3

For brevity, the fundamental equations may be written :—

$$g_{45} = 980·617 \text{ c.m./sec}^2.,$$

density of mercury at normal freezing-point of water = 13·5955

1 mercury-inch = 33·8632 millibars, 1 mercury millimetre = 1·33320 millibars.

1000 millibars = 1 bar = 29·5306 mercury-inches = 750·076 mercury millimetres, using 1 inch = 2·54000 cm.

TABLE II (A).

Relation between inches and millimetres for comparison of readings of barometers graduated in these units.

In.	Mm.	In.	Mm.	In.	Mm.	In.	Mm.
27·0	685·8	28·0	711·2	29·0	736·6	30·0	762·0
27·2	690·9	28·2	716·3	29·2	741·7	30·2	767·1
27·4	696·0	28·4	721·4	29·4	746·8	30·4	772·2
27·6	701·0	28·6	726·4	29·6	751·8	30·6	777·2
27·8	706·1	28·8	731·5	29·8	756·9	30·8	782·3

NOTE.—(1) The table is based on the *legal* relation 1 in. = 2·5400 cm., which agrees very closely indeed with the best experimental comparisons.

(2) As millimetre barometers have the same standard temperature 0° C. for the brass scale and for the mercury, while inch barometers have a standard 32° F. for the mercury and 60° F. for the brass scale, the readings require correction for temperature by appropriate tables before the comparison can be made.

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5 = showers at intervals.
6 = rain or drizzle.
7 = snow or wet snow.
8 = hail, or rain and hail.
9 = thunderstorms.

Code 6 = visibility = V, Vs.

0 = objects not visible at 50 metres.
1 = objects visible at 50 metres but not at 200 metres.
2 = „ „ 200 „ „ 500 „
3 = „ „ 500 „ „ 1,000 „
4 = „ „ 1,000 „ „ 2,000 „
5 = „ „ 2,000 „ „ 4,000 „
6 = „ „ 4,000 „ „ 7,000 „
7 = „ „ 7,000 „ „ 12,000 „
8 = „ „ 12,000 „ „ 30,000 „
9 = „ „ 30,000 and exceptionally clear air.

Code 7 = state of sea = K.

0 = no swell.
1 = moderate swell, calm sea.
2 = strong swell, „ „
3 = no swell, moderate sea.
4 = moderate swell „
5 = strong swell, moderate sea.
6 = rough sea.
7 = high sea.
8 = very high sea.
9 = phenomenal, precipitous.

Code 8 = characteristic of barometric tendency = c (3 hours preceding).

0 = steady or rising ....
1 = rising, now steady ....
2 = rising, now falling ....
3 = falling or steady, now rising ....
4 = unsteady, but rising ....

} barometer is higher, or the same as three hours preceding.

5 = falling constantly ....
6 = falling, now steady ....
7 = falling, now rising ....
8 = steady or rising, now falling ....
9 = unsteady, but falling.

} Barometer is lower than three hours preceding.

Code 9 = humidity* = H.

0 = 95–100 per cent.
9 = 90– 94 „
8 = 80– 89 „
7 = 70– 79 „
6 = 60– 69 „
5 = 50–59 per cent.
4 = 40–49 „
3 = 30–39 „
2 = 20–29 „
1 = 0–19 „

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* Humidity = dampness. In meteorology it is used for relative humidity or proportion of moisture to saturation.

TABLE III.—TABLE OF CORRECTIONS FOR REDUCING BAROMETRIC HEIGHTS TO 0° C. AND TO SEA LEVEL.

NOTE.—The barometric reading should first be corrected for index error. This error may be neglected if it is less than 0·3 mm. The + sign indicates that the correction is to be *added* to the barometric ruling. The − sign indicates that the correction is to be *subtracted*.

Temperature by the thermometer attached to the barometer			−4° C. 24·8° F.	−2° C. 28·4° F.	0° C. 32° F.	+2° C. 35·6° F.	4° C. 39·2° F.	6° C. 42·8° F.	8° C. 46·4° F.	10° C. 50° F.	12° C. 53·6° F.	14° C. 57·2° F.	16° C. 60·8° F.	18° C. 64·4° F.	20° C. 68° F.	22° C. 71·6° F.	24° C. 75·2° F.	26° C. 78·8° F.	28° C. 82·4° F.
			Corrections to be made.																
Height of barometer cistern above sea level. M'tres.	Ft.	In.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.	Mm.
0	0	0	+0·5	+0·3	0·0	−0·2	−0·5	−0·7	−1·0	−1·2	−1·5	−1·7	−2·0	−2·2	−2·5	−2·7	−3·0	−3·2	−3·5
1	3	3	+0·6	0·4	+0·1	0·1	0·4	0·6	0·9	1·1	1·4	1·6	1·9	2·1	2·4	2·6	2·9	3·1	3·4
2	6	7	+0·8	0·5	0·3	0·0	0·3	0·5	0·7	1·0	1·2	1·5	1·7	2·0	2·2	2·5	2·8	3·0	3·2
3	9	10	+0·9	0·6	0·4	+0·1	0·1	0·4	0·6	0·9	1·1	1·4	1·6	1·9	2·1	2·4	2·6	2·9	3·1
4	13	1	+1·0	0·8	0·5	0·2	0·0	0·3	0·5	0·8	1·0	1·2	1·5	1·7	2·0	2·2	2·5	2·8	3·0
5	16	5	+1·2	0·9	0·7	0·4	+0·1	0·1	0·4	0·6	0·9	1·1	1·4	1·6	1·9	2·1	2·4	2·7	2·9
6	19	8	+1·3	1·0	0·8	0·5	0·2	0·0	0·3	0·5	0·8	1·0	1·3	1·5	1·8	2·0	2·3	2·6	2·8
7	22	0	+1·4	1·2	0·9	0·6	0·3	+0·1	0·1	0·4	0·6	0·9	1·1	1·4	1·6	1·9	2·2	2·4	2·7
8	26	3	+1·5	1·3	1·0	0·7	0·5	0·2	0·0	0·3	0·5	0·8	1·0	1·3	1·5	1·8	2·1	2·3	2·6
9	29	6	+1·7	1·4	1·2	0·8	0·6	0·3	+0·1	0·2	0·4	0·6	0·9	1·1	1·4	1·6	2·0	2·2	2·5
10	32	10	+1·8	1·6	1·3	1·0	0·7	0·5	0·2	0·0	0·3	0·5	0·8	1·0	1·3	1·5	1·9	2·1	2·4
11	36	1	+1·9	1·7	1·4	1·1	0·8	0·6	0·3	+0·1	0·2	0·4	0·7	0·9	1·2	1·4	1·8	2·0	2·2
12	39	4	+2·0	1·8	1·5	1·2	1·0	0·7	0·5	0·2	0·0	0·3	0·5	0·8	1·1	1·3	1·6	1·9	2·1
13	42	8	+2·2	1·9	1·7	1·3	1·1	0·8	0·6	0·3	+0·1	0·2	0·4	0·7	0·9	1·2	1·5	1·8	2·0
14	45	11	+2·3	2·0	1·8	1·5	1·2	0·9	0·7	0·4	0·2	0·0	0·3	0·6	0·8	1·1	1·4	1·6	1·9
15	49	3	+2·4	2·2	1·9	1·6	1·4	1·1	0·8	0·6	0·3	+0·1	0·2	0·5	0·7	1·0	1·3	1·5	1·8
16	52	6	+2·5	2·3	2·0	1·7	1·5	1·2	0·9	0·7	0·4	0·2	0·1	0·4	0·6	0·9	1·2	1·4	1·6
17	55	9	+2·6	2·4	2·1	1·9	1·6	1·3	1·1	0·8	0·6	0·3	+0·1	0·3	0·5	0·8	1·0	1·3	1·5
18	59	1	+2·8	2·5	2·3	2·0	1·7	1·4	1·2	0·9	0·7	0·4	0·2	0·1	0·4	0·6	0·9	1·2	1·4
19	62	4	+2·9	2·6	2·4	2·1	1·9	1·5	1·3	1·0	0·8	0·6	0·3	0·0	0·3	0·5	0·8	1·0	1·3
20	65	7	+3·0	2·8	2·5	2·3	2·0	1·7	1·4	1·2	0·9	0·7	0·4	+0·1	0·2	0·4	0·7	0·9	1·2
21	68	11	+3·1	2·9	2·6	2·4	2·1	1·8	1·5	1·3	1·0	0·8	0·5	0·2	0·1	0·3	0·6	0·8	1·1
22	72	2	+3·3	3·0	2·8	2·5	2·2	1·9	1·7	1·4	1·2	0·9	0·6	0·3	+0·1	0·2	0·4	0·7	0·9
23	75	6	+3·4	3·1	2·9	2·6	2·4	2·1	1·8	1·5	1·3	1·0	0·8	0·4	0·2	0·1	0·3	0·6	0·8

TABLE IV.—CORRECTIONS FOR REDUCING THE BAROMETER READINGS FOR GRAVITY AT LATITUDE 45°.

For Latitudes 0° to 44° N. or S. the correction is to be *subtracted.*
„ 46° to 90° N. or S. „ „ *added.*

Latitude.		Height of the Barometer in Inches.								
		27·0	27·5	28·0	28·5	29·0	29·5	30·0	30·5	31·0
°	°	In.	In.	In.	In.	In.	In.	In.	In.	In.
45	45	·000	·000	·000	·000	·000	·000	·000	·000	·000
44	46	·002	·002	·003	·003	·003	·003	·003	·003	·003
43	47	·005	·005	·005	·005	·005	·005	·005	·006	·006
42	48	·007	·007	·008	·008	·008	·008	·008	·008	·008
41	49	·010	·010	·010	·010	·010	·011	·011	·011	·011
40	50	·012	·012	·013	·013	·013	·013	·013	·014	·014
39	51	·015	·015	·015	·015	·016	·016	·016	·016	·017
38	52	·017	·017	·018	·018	·018	·018	·019	·019	·019
37	53	·019	·020	·020	·020	·021	·021	·021	·022	·022
36	54	·022	·022	·022	·023	·023	·024	·024	·024	·025
35	55	·024	·024	·025	·025	·026	·026	·027	·027	·027
34	56	·026	·027	·027	·028	·028	·029	·029	·030	·030
33	57	·028	·029	·029	·030	·031	·031	·032	·032	·033
32	58	·031	·031	·032	·032	·033	·033	·034	·035	·035
31	59	·033	·033	·034	·035	·035	·036	·036	·037	·038
30	60	·035	·036	·036	·037	·038	·038	·039	·039	·040
29	61	·037	·038	·038	·039	·040	·040	·041	·042	·043
28	62	·039	·040	·041	·041	·042	·043	·043	·044	·045
27	63	·041	·042	·043	·043	·044	·045	·046	·046	·047
26	64	·043	·044	·045	·045	·046	·047	·048	·049	·049
25	65	·045	·046	·047	·047	·048	·049	·050	·051	·052
24	66	·047	·048	·049	·049	·050	·051	·052	·053	·054
23	67	·049	·049	·050	·051	·052	·053	·054	·055	·056
22	68	·050	·051	·052	·053	·054	·055	·056	·057	·058
21	69	·052	·053	·054	·055	·056	·057	·058	·059	·060
20	70	·054	·055	·056	·057	·058	·059	·060	·061	·062
19	71	·055	·056	·057	·058	·059	·060	·061	·062	·063
18	72	·057	·058	·059	·060	·061	·062	·063	·064	·065
17	73	·058	·059	·060	·061	·062	·063	·064	·065	·067
16	74	·059	·060	·061	·063	·064	·065	·066	·067	·068
15	75	·061	·062	·063	·064	·065	·066	·067	·068	·070
14	76	·062	·063	·064	·065	·066	·067	·069	·070	·071
13	77	·063	·064	·065	·066	·068	·069	·070	·071	·072
12	78	·064	·065	·066	·067	·069	·070	·071	·072	·073
11	79	·065	·066	·067	·068	·070	·071	·072	·073	·074
10	80	·066	·067	·068	·069	·071	·072	·073	·074	·075
9	81	·067	·068	·069	·070	·071	·073	·074	·075	·076
8	82	·067	·068	·070	·071	·072	·073	·075	·076	·077
7	83	·068	·069	·070	·072	·073	·074	·075	·077	·078
6	84	·068	·070	·071	·072	·073	·075	·076	·077	·079
5	85	·069	·070	·071	·073	·074	·075	·077	·078	·079
4	86	·069	·071	·072	·073	·074	·076	·077	·078	·080
3	87	·070	·071	·072	·073	·075	·076	·077	·079	·080
2	88	·070	·071	·072	·074	·075	·076	·078	·079	·080
1	89	·070	·071	·072	·074	·075	·076	·078	·079	·080
0	90	·070	·071	·073	·074	·075	·076	·078	·079	·080

Letters used to indicate the state of the weather :—

b = blue sky.	p = passing showers.
c = clouds (detached).	q = squally.
d = drizzling rain.	r = rain.
e = wet without rain.	s = snow.
f = foggy.	t = thunder.
g = gloomy.	u = threatening appearance.
h = hail.	v = visibility, objects at a distance unusually visible.
l = lightning.	w = dew.
m = misty.	z = haze.
o = overcast.	

ALGERIA.

Transmitting station—Oran (Ain-el-Turck) FUO.

Wavelength	3,300 m. C.W.	
Times of sending	0300 G.M.T.	Observations at 0100 G.M.T.
	0900 ,,	,, ,, 0700 ,,
	1145 ,,	,, ,, 0700 ,,
	1445 ,,	,, ,, 1300 ,,
	2000 ,,	,, ,, 1800 ,,

The 1145 message commences with the words "Meteo Alger," the remaining messages with the words "Meteo Oran."

0300 *Message*.

0100 Observations from Oran.

Code :—BBBDD FWTT βbb

0900 *Message*.

0700 Observations from—

31 La Senia (Oran).
32 Algiers.
33 Constantine.

Code :—Station number (two figures) BBBDD FWTTV βbbRR MMmmu.

Where V denotes visibility (special code below).

Groups giving upper winds in the Eiffel Tower code may be added.

The message also contains a repetition of the 0845 report from Mediouna.

NOTE.—The observation of State of Sea in the groups relating to Oran is made at Cap Falcon.

1445 *and* 2000 *Messages*.

1300 and 1800 observations respectively from the above Algerian Stations, together with repetitions of the 1430 and 1945 reports respectively from Mediouna.

Code :—BBBDD FWTT βbb.

1145 *Message*.

0700 Observations from—

Fal. =	Cap Falcon	(S)	
Alg. =	Algiers	(S)	
Nem. =	Nemours	(S)	S = Coastal Station.
Tns. =	Tenes	(S)	L = Inland Station.
Clb. =	Colomb Bechar	(L)	
Lag. =	Laghouat	(L)	
Tou. =	Touggourt	(L)	

Code :—Station name (three letters) BBDDF WbVu (coastal stations). BBDDF Wb (inland stations).

Where BB expresses the pressure in whole mm.

b is the barometric tendency (special code below) and

V the visibility (special code below).

This is followed by a statement in plain language giving the general situation and a forecast for the north coasts of Africa.

Code for Visibility (V).

0 =	Objects not visible at	50 m.
1 =	,, ,, ,,	100 m.
2 =	,, ,, ,,	500 m.
3 =	,, ,, ,,	1,000 m.
4 =	,, ,, ,,	2,000 m.
5 =	,, ,, ,,	4,000 m.
6 =	,, ,, ,,	10,000 m.
7 =	,, ,, ,,	20,000 m.
8 =	,, ,, ,,	50,000 m.
9 =	,, visible at	50,000 m.

Code for Barometric Tendency (b).

	Tendency in half-millimeters
0 = Steady	0 or 1
1 = Rising slowly	2 or 3
2 = Rising	4 to 7
3 = Rising rapidly	8 to 12
4 = Rising very rapidly	more than 12
5 = Falling slowly	2 or 3
6 = Falling	4 to 7
7 = Falling rapidly	8 to 12
8 = Falling very rapidly	more than 12

ARGENTINA

The Naval Observatory at Darsena Norte, situated on the northern entrance to the Port of Buenos Ayres, sends out, through the radio station located there, signals once daily at 10 p.m. (0200 G.M.T.) (Sundays and holidays excepted), on a wavelength of 800 metres. Their method of transmission consists of the sending of a series of five groups of dashes with a dot at each minute.

The method of transmission is as follows :—

a)	from 1.55′.00″ to 1.55′.50″	(Greenwich a.m. mean time) a warning signal consisting of an unbroken series of dashes ;
	at 1.56′.00″	a dot representing the 1st time-signal.
(*b*)	from 1.56′.15″ to 1.56′.50″	an unbroken series of dashes ;
	at 1.57′.00″	a dot representing the 2nd time-signal.
(*c*)	from 1,57′.20″ to 1.57′.50″	an unbroken series of dashes ;
	at 1.58′.00″	a dot representing the 3rd time-signal.
(*d*)	from 1.58′.25″ to 1.58′.50″	an unbroken series of dashes ;
	at 1.59′.00″	a dot representing the 4th time-signal.
(*e*)	from 1.59′.30″ to 1.59′.50″	an unbroken series of dashes ;
	at 2.00′.00″	a dot representing the 5th and last time-signal.

Time-Signals.	Greenwich time.
1st	1.56′.00″
2nd	1.57′.00″
3rd	1.58′.00″
4th	1.59′.00″
5th	2.00′.00″

Duration of dot = ¼ second.

AUSTRALASIA

Time signals are transmitted by the following stations :—

Adelaide Radio .. At 12.30 a.m. and p.m. Melbourne Time (0230 and 1430 G.M.T.), international time-signals being used. Wavelength 600.

Melbourne Radio .. At noon and midnight (Sundays excepted), Victorian standard time (0157–0200 and 1357–1400 G.M.T.), international time-signals being used. Wavelength 600 m.

Perth Radio .. At 9 a.m. and p.m. Melbourne Time (2300 and 1100 G.M.T.). Wavelength 600 metres.

Ocean forecasts are transmitted by the following stations at the hours specified (Melbourne time) :—

Perth, 11 p.m. (1300 G.M.T.).
Adelaide, 9.30 p.m. (1130 G.M.T.).
Brisbane, 10 p.m. (1200 G.M.T.).
Melbourne, 9 p.m. (1100 G.M.T.).
Sydney, 8.30 a.m. and p.m. (2230 and 1030 G.M.T.).

Other stations repeat as necessary.

At present an official Ocean Forecast is transmitted daily from the Central Weather Bureau, Melbourne, to all Radio Stations in Australia, also Port Moresby (New Guinea), and it is preceded by a specific statement of sea conditions existing at 9 a.m. around Australia, and sea disturbances off any part of the coast. This information can be obtained by vessels upon request. When weather conditions are severe storm warnings are sent out broadcast by the Shore Stations, and vessels receiving the warnings are requested to communicate them to passing shipping by means of code flags.

Each of the principal radio stations is supplied with a barometer for the purpose of giving information, so that if a shipmaster desires he may obtain the barometer reading, also wind and weather conditions at a radio station, by asking the operator in charge. Daily weather reports (barometer readings, state of wind, weather and sea) are received at the Meteorological Bureau, Melbourne, from shipmasters whenever their vessels are in Australian waters.

The restrictions which were placed on wireless messages during the war have now been removed, and steps have been taken to bring about the resumption of radio weather reports from ships when 300 miles or more from the Australian coastline—many messages are now being received.

NEW ZEALAND

New Zealand stations send out weather forecasts on 600-metre wavelength, Mondays to Fridays, inclusive, as follows :—

Radio Awarua	8.30 p.m.
Radio Wellington	9 p.m.
Radio Awanui	10 p.m.

The above are New Zealand mean time—11½ hours ahead of G.M.T.

The forecast is not sent out on Saturday or Sunday unless the condition are exceptional.

Provisional Wireless Time Service.

It is notified for general information that arrangements have been made for a provisional wireless time service from the standard mean time clock of the Hector Observatory, Wellington, New Zealand. This service will begin on———— (*see* Note below).

The time signals are transmitted by the Wellington Radio Station on a wavelength of 600 metres; the sending key at the radio station being automatically operated by the observatory clock.

The time signal begins at 21 hours 0 minutes 0 seconds Greenwich Mean Time (8 hours 30 minutes p.m. New Zealand Time), and is repeated on the 1st, 2nd, 4th, and 5th minutes.

Each time signal begins exactly at the beginning of the minute and lasts for one second approximately.

In addition to the automatic time signals other signals are transmitted by hand, but they must NOT be used as time signals.

The signals are transmitted in the following manner:—

Greenwich Mean Time.

h.	*m.*	*s.*		*h.*	*m.*	*s.*	
20	58	00	to	20	59	05	New Zealand Observatory Time Signals twenty-one hours Greenwich Mean Time. New Zealand Observatory Time Signals twenty-one hours Greenwich Mean Time.
20	59	15	to	20	59	45	— — · — — · — — · — — · etc.
21	00	00	to	21	00	01	— Time Signal.
21	00	15	to	21	00	45	— — · — — · — — · — — · etc.
21	01	00	to	21	01	01	— Time Signal.
21	01	15	to	21	01	45	— — · — — · — — · — — · etc.
21	02	00	to	21	02	01	— Time Signal.
21	02	15	to	21	03	45	— — · — — · — — · — — · etc.
21	04	00	to	21	04	01	— Time Signal.
21	04	15	to	21	04	45	— — · — — · — — · — — · etc.
21	05	00	to	21	05	01	— Time Signal.

The Greenwich Mean Times that the Wireless Time Signals begin at, and the corresponding New Zealand Times are:—

		Greenwich Mean Time.				New Zealand Mean Time.			
		h.	*m.*	*s.*		*h.*	*m.*	*s.*	
1st Time Signal	..	21	00	00	..	8	30	00	p.m.
2nd ,, ,,	..	21	01	00	..	8	31	00	p.m.
3rd ,, ,,	..	21	02	00	..	8	32	00	p.m.
4th ,, ,,	..	21	04	00	..	8	34	00	p.m.
5th ,, ,,	..	21	05	00	..	8	35	00	p.m.

There is no time signal at 21 hours 03 minutes 00 seconds.

The provisional wireless time service will be in operation on Tuesdays and Fridays, provided satisfactory observations have been obtained. The wireless time service will be suspended when owing to bad weather or other causes it is not possible to supply accurate time signals.

N.B.—The date at which this service should begin is left open until the fate of the New Zealand Standard Time Bill is decided by Parliament, because if the Standard Time Bill is passed all New Zealand Mean Times quoted in the notice would have to be increased by 30 minutes.

General Conditions, Australia and New Zealand.

Any request for information must be addressed to the Coast Station in the form of a Service message signed by the Commander or responsible officer deputed by him. Information regarding weather should not be asked for during hours of darkness, but should be listened for at the regular transmission periods. Providing, however, that there is no jamming, permission is granted for ships to call up shore stations during the daylight hours to obtain weather reports.

AUSTRIA

Transmitting station, Deutsch Altenberg (near Vienna) OHL. Wavelength 5,600 m. c.w. (or in the case of disturbance of the main plant 3,500 m. spark).

Time of sending—1000 (observations at 21h. and 7h.).
1540 (observations at 14h.)

Observations relate to the following stations:—

01 = Vienna.
02 = Sonnblick (Lat. 47° 3′. Long. 12° 57″).
03 = Feldkirch.
04 = Innsbruck.
05 = Salzburg.
06 = Linz.
07 = Gratz.
08 = Klagenfurt.
09 = Obir (lat. 46° 30′. Long. 46° 30′).

1,000 *Report*:—Station number, code BBBDD FWTTC BBBDD FWTTC βbbRR MMmm.

1540 *Report*.—BBBDD FWTTC.

In the case of high-altitude stations (Sonnblick 3,100 m.; Obir 2,041 m.), barometric pressure is not reduced.

BALTIC

The stations of Riga (KCA), Leepaja (Libau) (KCB), and Ventspils (Windau) (KCC) are sending if necessary, a CQ mine-warning, and will send in the nearest time meteorological, and in the winter, nautical (ice warning) signals from the Gulf of Riga.

BARBADOS

Should steamers require the local weather reports, they are given. No arrangements are made for sending Time, Hydrographic or Press Signals.

BELGIUM

Hourly Meteorological Reports are issued daily from Brussels (HS) on a wavelength of 1400 m. at 25 minutes past each hour from 0625 to 1525 (excepting 0825, 1225 and 1425) in exactly the same code as that used for hourly reports in Great Britain (q.v.). The reports refer to Brussels and reports from Ostend are added to the Brussels message two or three times daily. Observations for Brussels include pilot balloon ascents.

A report for Brussels in standard code for synoptic reports is also issued at 0715, 1315, 1815 G.M.T. These reports refer to observations at 7h, 13h, and 18h respectively.

The Belgian Meteorological Office transmits daily at noon a weather forecast for Belgium and Western Europe in French. This report is issued specially for amateurs, and therefore is transmitted very slowly and repeated. The transmitting station is Uccle (H.S.) and the wavelength used is 1,500 metres. The message lasts for about 20 minutes; it could very easily be picked up in England, and would prove a very good Morse lesson for beginners.

BELGIAN CONGO

The following stations in this territory, viz.: Kinshasa, Coquilhatville, Umangi-Lisala, Lusambo, Bunia-Kilo, Lukuga, Kindu, Stanleyville, and Elizabethville, have been organised to deal with time signals as follows:—

(1) Daily reception of time signals from Lyons Station (France).

(2) Emission of an approximate time signal to stations within range.

BOLIVIA

In this Republic an important meteorological service is carried on as an auxiliary of the telegraphs. Father Tortoso, Director of the Astronomical Observatory of the San Calixto College, collects and collates a number of data covering his district. The Marconi Wireless Telegraph Station in Viacha possesses also an annexe wherein are installed instruments for this purpose. Small meteorological installations also exist in Tarija, Villa Montes, Ulla-Ulla and Copacabana, whilst others are projected in Cuatro Ojos and Puerto Suarez.

BRAZIL

The Naval Radio Station at Ilha do Governador (SOH) transmits twice daily a series of time signals, planned in accordance with the International Convention, and transmitted on a wavelength of 1,800 metres. These signals start at 10 hours 55 minutes 0 seconds, and at 20 hours 55 minutes 0 seconds, Rio de Janeiro time (1357–1400 and 2357–2400 G.M.T.), and follow the same procedure as that detailed below under " France, Eiffel Tower." Like the French signals, the Brazilian series is introduced by the letter O (▬ ▬ ▬) of the Morse alphabet, and the authorities notify us that these introductory signals, which finish at 10 hours 56 minutes 50 seconds, " are for the special use of the observatory, and, therefore, it may be decided at any time to dispense with them." They also state that in case of " an accident preventing the transmission for correct reception of the signals either at 11 or 21 o'clock, the signals will be repeated in each case half an hour later at 27–30 minutes, instead of 57–60 minutes."

Directly after the time signals for 11 and 21 o'clock, meteorological and weather signals are issued.

This report includes observations taken from Buenos Ayres to Pernambuco, and, in brief, up to the extreme north.

The following is the code in which the meteorological reports are issued :—

Station Call Letters, BBBDDFWS.

Example : SL 567021141 FT 567020 XX RF, etc.

The station letters are as follows :—

MN = Manáos.	VT = Victoria.	FP = Florianopolis.
BL = Belem.	CF = Cabo Frio.	RG = Rio Grande.
SL = S. Luiz.	RJ = Rio Janeiro	PA = Porto Alegre.
FT = Fortaleza.	SP = S. Paulo.	CB = Corumbà.
RF = Recife.	ST = Santos.	MV = Montevidéo.
BH = Bahia.	PG = Paranaguá.	AB = Buenos Ayres.

BRITISH HONDURAS

Weather reports are sent out daily by the station at Belize from June to November inclusive at 1140 and 2400 G.M.T. Wavelength 1,000 metres.

BULGARIA

Meteorological reports are issued three times daily from Sofia (FF) on a wavelength of 3,800 metres at 0530, 0900, 1,545 G.M.T. (?)

CANADA AND NEWFOUNDLAND

A time signal is sent out by the Camperdown Station daily at 2 p.m. (G.M.T.) on a wavelength of 600 metres.

Weather and ice reports are broadcasted as follows :—

VAL = Barrington Passage	0130 and 1330	G.M.T.	1,600 m.	wavelength
VCE = Cape Race	0215 ,, 1415	,,	600 m.	,,
VCM = Belle Isle....	0230 ,, 1430	,,	600 m.	,,
? = Mt. Pearle (Naval Station)	? ?	,,	1,600 m.	,,
VCU = Cape Sable	0200 ,, 1400	,,	600 m.	,,
VCG = Fame Point	0145 ,, 1345	,,	600 m.	,,

The stations of Alert Bay, B.C., Belle Isle, Camperdown, N.S., Cape Bear, Cape Lazo, Cape Race, Cape Ray, Cape Sable, Clarke City, Dead Tree Point, Digby Island, Estevan, B.C., Fame Point, Father Point, Gonzales Hill, Grindstone Island, Grosse Isle (Quebec), Harrington, Heath Point, Ikeda Head, Kingston (Ontario), Midland (Ontario), Montreal, North Sydney, N.S., Pachena, Partridge Island, Pictou, N.S., Point Amour, Point Edward, Point Grey, Point Riche, Port Arthur (Ontario), Port Burwell, Quebec, Sable Island, Sault Ste. Marie (Ontario), Three Rivers (Quebec), Tobermory (Ontario), Toronto, and Triangle Island receive weather forecasts from the Canadian Meteorological Service at 10 p.m. These advices will be transmitted free to any ship station on request. In addition, the station transmits, without coast charge, radiotelegrams of the following kinds :—

1. Any message concerning the navigation of a vessel sent by the captain of the vessel and intended for any department of the Government, any officer of the Government, or the officer in charge of the coast station.

2. Messages exchanged between the captain of any vessel and any person whatsoever concerning the state of the weather, the condition of the tide or ice, or reports on aids to navigation.

CANARY ISLANDS

A meteorological report, in code, is issued twice daily from the Izana Observatory on Teneriffe Island to Carabauchel (a military station in Madrid) at 0950 and 1415 G.M.T.

CHILE

RADIOTELEGRAPH TIME SIGNAL. TRANSMITTED EVERY NIGHT EXCEPTING SATURDAYS AND SUNDAYS AND HOLIDAYS OF THE OFICINA DE HIDROGRAFIA Y NAVEGACION, VALPARAISO.

Important.—The signals will commence punctually at 12 h. 55 m., Greenwich Mean Time, continuing for exactly five minutes and terminating precisely at 13 h., Greenwich Mean Time (8 h. 12 m., 13·7 s. to 8 h. 17 m. 13·7 s., local time).

The Oficina de Hidrografía y Navegación transmits daily the radiotelegraph time signal commencing exactly at 12 h. 55 m., Greenwich Mean Time, and continuing for five minutes. (Length of wave, 600 metres.) During this interval each tick or stroke given by the master chronometer of the Oficina is transmitted by the radiotelegraph wave, excepting the twenty-ninth second of every minute, and the last ten seconds of each one of the five minutes. At the exact termination of the five minutes, which will be 1300 Greenwich time, the cipher which indicates the end of the signal is marked by a long contact, as may be seen exactly from the diagram.

If for any reason there should be an error in transmission, the signal "Senal Nula" (Signal null) will be transmitted repeated three times at 1301 (G.M.T.).

RADIOTELEGRAPH WEATHER REPORTS TRANSMITTED DAILY BY THE STATION OF VALPARAISO.

The Radiotelegraph Station of Valparaiso CCE transmits daily and with the same length of wave as that with which the time signal is transmitted—viz., 600 metres—the meteorological conditions of certain points on the coast and of the Island of Juan Fernandez.

In order that these signals may be received without difficulty by all vessels, they will be transmitted very slowly.

Except on Sundays and holidays there will be transmitted each day at 12 noon, civil mean time of the meridian 70° 41′ 34″ 5 W. (1643 G.M.T. nearly), the meteorological conditions at 8 a.m., and at 9 p.m. (time of the same meridian). those prevailing at 4 p.m., there being added to the last report a résumé containing the variations undergone by the atmospheric factors of the day.

The stations on the coast will be represented by letters of the alphabet, generally by the first letter of their name, and in the following form :—

V = Valparaiso.	J = Juan Fernandez.	R = Raper.
T = Talcahuano.	M = Mocha.	P = Punta Arenas.
C = Corral.	G = Guafo.	

The signal will be sent commencing with the letters O.M.C. (Meteorological Office of Chile). Next will be given the barometric pressure in millimetres at sea-level, but suppressing the figure representing the hundreds; thus, to indicate a pressure of 753 millimetres, the figure 7 will be suppressed and the number 53 will be transmitted.

Following upon that number 53 will be another numerical figure indicating the direction of the wind. The figures used will be from 1 to 8, as follows: 1 corresponding to N.; 2, NE; 3, E; 4, SE; 5, S; 6, SW; 7, W; 8, NW.

Lastly will follow another figure indicating the force of the wind, according to the scale of Beaufort; but when forces above 8 have to be given, they will be signalled in words: nine, ten, eleven and twelve.

In the event of its not being possible to communicate the meteorological conditions at any of the stations, the word "N" will be placed before the representative sign of the station in question, but if it is only a part of the information that cannot be given, that part will be replaced by the letter "X."

If the weather is not good in the ports indicated by the bulletin, there will be added in current language some of the words, such as storm, mist, rain or sun.

In order that this may be better understood, we give below a specimen bulletin :—

O.M.C. V 5534, T 5921, C 5172, M 5765, etc.

which signifies :—

Valparaiso,	barometric pressure	755 mm.,	wind	E,	force	4
Talcahuano	,,	759 mm.	,,	NE	,,	1
Corral	,,	751 mm.	,,	W	,,	2
Mocha	,,	757 mm.	,,	SW	,,	5

CHINA

The Shanghai-Zikawei station receives the time of the 8th time-belt (120° east of Greenwich) from the observatory of Zikawei; and transmits it on the wavelength of 850 metres according to the following table :—

from	10.53′	to	10.54′	a.m.	preliminary signals.
from	10.54′	to	10.54′.50″	a.m.	a series of "G."
at	10.55′			a.m.	a dot.
from	10.56′	to	10.56′.50″	a.m.	a series of "O."
at	10.57′			a.m.	a dot.
from	10.58′	to	10.58′.50″	a.m.	a series of "X."
at	10.59′			a.m.	a dot.
from	4.53′	to	4.54′	p.m.	preliminary signals.
from	4.54′	to	4.54′.50″	p.m.	a series of "G," etc.

continuing as in the morning.

These times are 0253-0259 and 0853-0859 (G.M.T.).

The time-signal, morning and evening, is followed immediately by a meteorological telegram.

During the typhoon season, the station transmits, in addition to these periodical messages, useful information on the state of the weather.

No charge is made for the meteorological information.

The Cape d'Aguilar station sends time of Hong-Kong observatory on a wavelength of 1,000 metres at 0356-0400 and 1256-1300 (G.M.T.).

CUBA

The experimental station of de Belen at Havana has been assigned to the reception of meteorological signals. (*No further particulars are yet to hand.*)

CZECHO-SLOVAKIA

Transmitting station: Prague (PRG).
Wavelength: 4,500 m. c.w.
Normal range: 3,000 km.
Times of sending: 0930 G,M,T, (observations at 7 h.)
,, ,, 1530 G.M.T. (observations at 13h.)
,, ,, 2030 G.M.T. (observations at 18 h.)

Identification Number	*Place*	*Latitude*	*Longitude*
		N.	E.
01	Prague	50° 04′	14° 28′
02	Tabor	—	—
03	Č. Budějovice (Budweis)	48° 58′	14° 28′
04	Memecky Brod	—	—
05	Čheb (Eger)	50° 05′	12° 23′
06	Milesovka (Donnersberg), Altitude 840 m.	50° 33′	13° 56′
07	Usti	50° 40′	14° 02′
08	Trutnov	—	—
09	Č. Třebová (Böhm. Trübau)	49° 54′	16° 29′
11	Opava	49° 56′	17° 53′
12	Brno	49° 12′	16° 37′
13	Znojmo	—	—
14	Strážnice	48° 53′	17° 18′
17	Rajecke Teplice	—	—
18	Oravský Podzámok (Arvaváralja) ..	49° 16′	21° 21′
22	Bratislava	48° 09′	17° 07′
23	Stará Ďala (O-Gyalla)	47° 53′	18° 11′
24	Nová Ves (Igló)	48° 56′	20° 33′
25	Kosice	48° 43′	21° 16′
26	Užhorod (Ungvár)	48° 36′	22° 18′
28	Přerov (Prerau)	49° 27′	17° 27′
29	Stary Smokovec	—	-
31	Klatovy	—	—
32	Olomovc	49° 35′	17° 15′
34	Nitra	48° 18′	18° 5′

The results of pilot balloon ascents are sent in the same code as Eiffel Tower reports (q.v.).

The code used in these reports is :—

Météo tchécoslovaque".

9h. 30 (G.M.T.)	01	BBBDD FwwTT cbWVH ALaNh RRmmr GddVV
	05, 06, 23, 25, 32	BBBDD FwwTT cbWVH ALaNh RRmmr
	sondages :	
	01, 05, 34	h,ddvv • • • • • • • • • •

Météo tchécoslovaque".

15h. 30 (G.M.T.)	01	BBBDD FwwTT cbWVH ALaNh CddVV
	05, 06, 23, 25, 32	BBBDD FwwTT cbWVH ALaNh

Météo tchécoslovaque".

20h. 30 (G.M.T.)	01	BBBDD FwwTT cbWVH ALaNh RRMMr GddVV
	05, 06, 23, 25, 32	BBBDD FwwTT cbWVH ALaNh RRMMr

DENMARK

Wireless Meteorological Reports.

Transmission station : Lyngby Radio (near Copenhagen).
(position 56° 46′ N. ; 12° 29′ E.)
Length of wave : 3,650 metres C.W.
Call signal : OXE.
Normal range : 3,000 km.

Times of sending : 0735 G.M.T. (observations at 0700 G.M.T.)
,, ,, 1335 G.M.T. (observations at 1300 G.M.T.)
,, ,, 1835 G.M.T. (observations at 1800 G.M.T.)

Observations relate to the following stations :—

		Position.	
		Lat.	*Long.*
Copenhagen	0 1	55° 41′	12° 35′
Skagen	0 2	57° 44′	10° 38′
Hanstholm	0 3	57° 7′	8° 36′
Blaanvandshuk ..	0 4	55° 33′	8° 5′
Hammeren	0 5	55° 17′	14° 46′

The wireless stations in Copenhagen and Blaavand receive every day from the Meteorological Institute in Copenhagen a repeat in the English language about the atmospheric conditions in the Danish waters. This repeat is on demand sent to ships at sea against payment of 1 franc.

Each radio telegram begins with the words : " Meteo Danois."

The 7 o'clock observations will be transmitted for each station in four groups of five figures : BBBDD, FWTTC, BbbRR, MMmmu, to be deciphered according to the normal international code.

The 13h. observations will be transmitted for each station in three groups, two of 5 figures and one of 3 :—

BBBDD FWTTu βbb

The 18h. observations will be transmitted in three groups of 5, 4, 3 figures respectively :—

BBBDD FWTT βbb

The figure indicating the condition of the sea (u) is omitted in the groups relating to Copenhagen.

Observations which are not reported in one message will be transmitted at the beginning of the next report by adding the hour of the missing observation to the station call signal.

SPECIMEN RADIO TELEGRAMS.

Morning radio :—

meteo danois 01 65732 41139 00000 2112 02 66152 34159 30101 20143 03 68732 24119 00001 16102 05 62528 33129 00000 16112.

Following radio at 1335 :—

meteo danois 0407 68628 32129 20300 19082 01 64952 2117 306 02 65952 13182 001 03 67280 42153 312 04 68530 20171 000 05 60578 53173 316.

In the above morning radio, the Blaavandshuk (04) morning observation is missing. This morning observation will be found in the 1335 radio after the group 0407 (indicating Blaavandshuk at 7 o'clock).

Besides this, the addition of the call signal of a station at the time of observation will be used to correct a faulty message.

ICE REPORTS.

Every day in the winter at 1100 and 2100 (G.M.T.) if ice service has been ordered a radio telegraphic report is sent from the wireless station in Copenhagen. The reports are composed in the English language and contain a short report about the ice in Danish waters. The reports are emitted in the following manner :—

First the sign — • — • — and the call signal OXA (three times), followed by the word "Ice report." Then the number of words, the sign — • • • — and then the text of the report which is given twice, separated by the sign — • • • —. At the end the call signal OXA (three times) and the sign • • • — • — •.

For instance :—

— • — • — OXA OXA OXA Ice report 26w — • • • — Kattegat, Westchannel closed for sailing vessels. Eastchannel pack-ice. Steamers beset southern part of Kattegat open ice. Sound and Bight driftice, along westcoast pack-ice. All lightships removed — • • • —; then full repetition of the text and at last OXA OXA OXA • • • — • — •.

ESTHONIA

Meteorological reports are issued twice daily from Reval (ELN) on a wavelength of 2,000 m. (C.W.) at 0835 and 2100 G.M.T., giving observations for 0700 and 1300 and 2100, made at (1) Reval, (2) Dorpat, and (3) Filsand.

Each message begins with the words Meteo Esthonie. A fixed order of stations is adhered to in the messages, but in the evening messages *all* the 1300 reports precede the 2100 reports. For the 0700 observations the code used is—

BBBDD FWTTW¹ B¹B¹B¹RR MMmm

The value of tendency is given in tenths of a millimetre, and 500 is added for a falling barometer: 50 is also added to the direction of the wind for this case. For the 1300 and 2100 observations the code used is—

BBBDD FWTTW[1]

Example of an evening message:—

Meteo Esthonie 65232 25122 x x 66728 15141 62316 12035 59418 13045 63120 14065

The x x indicate that the midday observations for Dorpat are missing: the last six groups give the 2100 observations at Reval, Dorpat and Filsand.

FALKLAND ISLANDS.

The only meteorological station in existence is at the South Orkney Islands, which the Argentine Government has established with the permission of H.M. Government.

FRANCE.

The following arrangements are based on the decision arrived at by the International Time Conference, held in Paris in 1912, modified from time to time in accordance with the experience gained. The latest modifications were made on November 15th, 1921, and are as follows:—

Lyons (YN) now transmits rhythmic scientific signals (beats) at 0800; the international signals from Paris (FL) and beats formerly transmitted at 0955 and 1030 have been advanced by half an hour; the two series of beats transmitted by Paris (FL) at 2110 and at 2300 have been replaced by a single transmission at 2200; the non-musical beats at 2330, the only regular service which was still being sent from the old spark transmitter of the Eiffel Tower, has been suppressed; the Time (old system) signals from Paris (FL) formerly transmitted at 2345 have been advanced by one hour. The only transmissions remaining unchanged are the Time (old system) signals from Lyons (YN) at 0900, and from Paris (FL) at 1045, and the beats from Bordeaux (LY) at 2000. The following is a table of these changes:—

0800	Lyons	(YN)	15,500	C.W.	Rhythmic scientific signals.
0900	Lyons	(YN)	15,500	C.W.	Time signals (old system).
0925	Paris	(FL)	2,600	Spark	International time signals.
1000	Paris	(FL)	2,600	Spark	Rhythmic scientific signals.
1045	Paris	(FL)	2,600	Spark	Time signals (old system).
2000	Bordeaux	(LY)	23,450	C.W.	Rhythmic scientific signals.
2200	Paris	(FL)	2,600	Spark	Rhythmic scientific signals.
2245	Paris	(FL)	2,000	Spark	Time signals (old system).

[For times and nature of transmission previous to these modifications see 1921 edition].

Ordinary Time Signals.

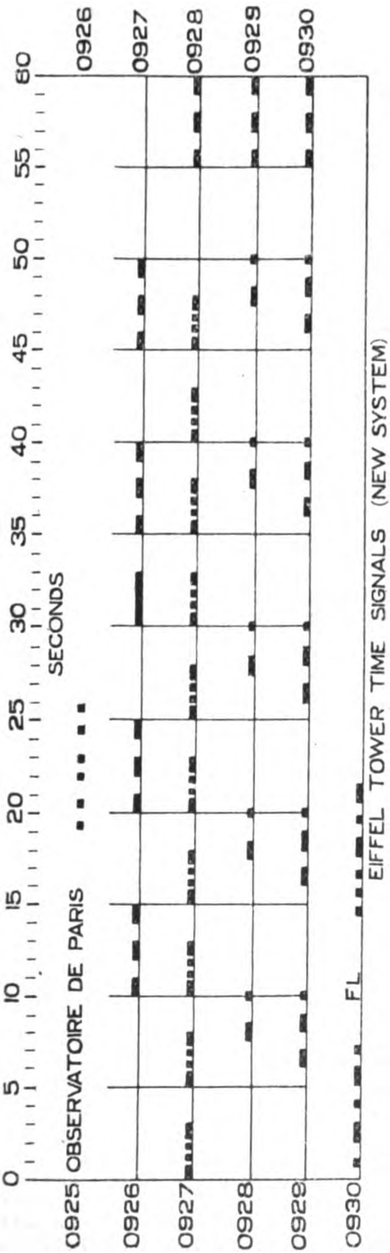
The ordinary Time Signals on both the International and old French Systems are transmitted automatically by means of special apparatus situated at the observatory in Paris and managed by the staff of that establishment.

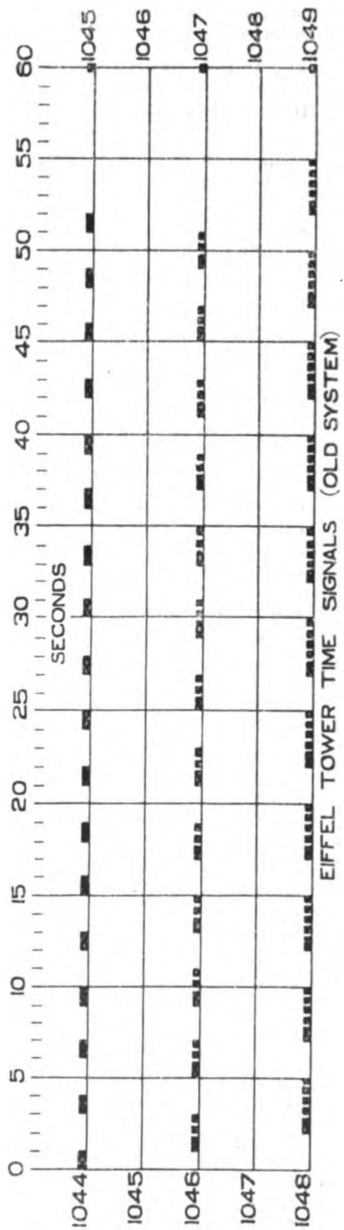
The connection between this apparatus and the radio station at Eiffel Tower is established a few instants before the transmission by means of subterranean lines.

Reference to the diagram on the opposite page will show the procedure adopted in sending these signals.

The letters O (▬ ▬ ▬) of the first minute and X (▬ • • ▬) of the second minute constitute only advice and tuning signals.

All the dashes, dots, and spaces of dots or dashes of any one letter in the remainder of the signals are of equal duration: dashes = one second, dots = one-quarter of a second, intervals = one second.


OBSERVATOIRE DE PARIS
SECONDS
EIFFEL TOWER TIME SIGNALS (NEW SYSTEM)
FL


SECONDS
EIFFEL TOWER TIME SIGNALS (OLD SYSTEM)

The letters N (— •) which characterise the third minute commence at the seconds, 8, 18, 28, 38, 48, and the beginning of the dots of these same letters coincide exactly with the seconds 10, 20, 30, 40, 50.

In the same way the letters G (— — •) characterising the fourth minute commence at the seconds 6, 16, 26, 36, 46, and the beginning of the dots of these same letters coincide exactly with the seconds, 10, 20, 30, 40, 50.

The second set of time signals starts with a series of " T " (—), followed by one dot at " time " precisely. At the third minute the French operator sends a series of " D " (— • •), which is again followed by a dot at " time," whilst the fifth minute starts a series of " 6 " (— • • • •), again followed by a dot at " time."

The signals " T," " D," and " 6," are sent by hand by an operator at the observatory, only the three dots at " time " (the end of the 1st, 3rd, and 5th minutes) are automatically sent by the special apparatus.

The ordinary time signals, on both the International and old French Systems by night are transmitted in the same way.

It frequently occurs, especially in winter, that the Paris Observatory is not able to make astronomical observations each night. It is therefore necessary to be satisfied with the times registered by the chronometers of which the rate is known for the setting of the clock which sends the signals. These chronometers being sufficiently numerous and accurate, such a procedure causes no inconvenience so long as the cessation of astronomical observations does not exceed a few days. If, on the other hand, the period of cloudy weather continues too long, it is no longer possible to answer for the accuracy of the chronometers. Wireless telegraphy in such cases furnishes a method which allows of the co-operation of other observatories, better situated as regards climatic conditions, in the determination of the state of the master-clock at Paris, and in consequence in the accurate setting of the clock which sends the signals.

Scientific Time Signals.

Preceeding the rhythmic scientific time signals three calls (— • — • —) are made.

Immediately following, a series of 300 dots each formed of a single spark were transmitted, the 60th, 120th, 180th and 240th being suppressed in order to establish the indication for counting purposes.

This series is heard at the observatory in Paris in a wireless receiver and compared with the tickings of a time-keeping clock by the coincidence method. A simple calculation permits of deducing the times (as marked by the clock) from the coincidences of the 1st and 300th dots of the series, which are exact to 1 or 2 hundredths of a second. These may be transformed into " legal time hours " by adding the corresponding correction of the clock.

These latter hours are transmitted by the Eiffel Tower soon after the end of the " ordinary time signals " at night, in the following manner :—

If the times of the 1st and 300th beats are, for instance, 11 hours 30 minutes 8.15 seconds p.m. and 11 hours 35 minutes 1.17 seconds p.m., the two following groups of figures will be twice repeated :—

— • • • — 300815. 350117 — • • • — 300815. 350117
— • • • — 300815. 350117.

In order to know approximately the correction to be made to a clock (or a chronometer) with reference to the legal international time of the observatory, it is sufficient to listen to the ticking of that instrument by means of a microphone suitably attached to a radiotelegraphic receiver at the same time as the series of 300 points are transmitted by the Eiffel Tower. It is necessary to observe and note the coincidences, and then the hours of the clock

(or the chronometer) should be calculated at the moment of the 1st and 300th dots.

By subtracting these times respectively from those sent out by the Eiffel Tower, it is possible to obtain two correcting values for applying to the readings of the clock for measuring time which should be correct to about two hundredths (.02) of a second.

The times of the first and three hundredth beats of the scientific signals are now given in sidereal* time instead of Greenwich mean time. For each series of beats transmitted by Lyons, Paris or Bordeaux, the times of the first and of the three hundredth beat are sent before the following signals from the same transmitter: the time of the beats from Lyons (YN) at 0800 before its French time signals at 0900. Those of the beats from Paris (FL) at 1000 before its French time signals of 1045. Those of the beats from Paris (FL) at 2200 before its French time signals of 2245. Bordeaux (LY) having only one transmission of time signals a day, the times of its beats of each day are sent before its scientific rhythmic signals of the next day.

The changes are the result of the meeting of the International Astronomical Union and their substance is as follows. Signals have hitherto been sent out at definite mean times. In future, beats 1 and 300 of the rhythmic signals will be sent according to Greenwich *sidereal** time. The interval between the beats will be 49/50 of a sidereal second (roughly 44/45 of a mean second, instead of 49/50, as formerly).

For some time after the change the signals will be preceded by the words " sidereal time."

METEOROLOGICAL REPORTS FROM EIFFEL TOWER.

(Call signal FL. Wavelength, 2600 m. spark.)

The meteorological messages from the Eiffel Tower contain observations from 22 French stations (*see* page 1151) and from Brussels, Mayence and other Continental stations, and are issued at the following hours (Greenwich time) :—

0245	Observations at	1h.
0815	,,	7h.
1415	,,	13h.
1930	,,	18h.

The messages are composed of two parts : (i) ordinary observations ; (ii) wind soundings.

NOTE.—As reference is made in this section to " Sidereal Time " the following explanation may be of use to readers :—

The celestial sphere apparently revolves once per day. As all time is measured by regularly recurring phenomena, the interval between two successive returns to a fixed point of this celestial sphere is called a sidereal day. Sidereal time is reckoned from the time when the first point of the constellation Aries passes the meridian.

Our ordinary affairs, however, are regulated by the solar day, which is the interval between two successive transits of the sun's centre over the meridian. If the orbit were not inclined to the equator, and the earth throughout its orbit not in any way influenced by other planets, the intervals between the two transits would be perfectly regular.

However, for reasons which can easily be discovered by the study of astronomical text-books, the intervals between these transits are not regular, and therefore an imaginary " mean sun " is used in astronomical calculations so that the length of the conventional solar day may be kept uniform. This " mean sun " may be supposed to move with uniform velocity, completing its circuit in the same time as the real sun. When the imaginary sun is on the meridian it is the " mean noon " and when the real sun is on the meridian it is " apparent noon."

The solar day is about four minutes longer than the sidereal day for the sun appears to move eastward among the stars at the rate of about one degree a day. About March 21st the solar clock agrees with the sidereal clock, but the sidereal clock gains nearly four minutes every day. At other times there will be considerable differences between the two clocks.

(1) Observations at 7h.

(i) Ordinary observations—code,

Stations 01 to 34	BBBDD	FWTTC	βbbRR	MMmmu
„ 51 to 55	BBBDD	FWTTC	βbbRR	
„ 61 to 64	BBBDD	FWTTC	βbbRR	MMmmu

Note.—The barometer reading for Saentis (a mountain station) which is only included in the reports for 0815 and 1415, is not corrected to mean sea-level.

The symbols have their usual significance, according to International Code, but barometric values are expressed in millimetres and tenths.

Eiffel Tower Code for Upper Winds.

(ii) Wind soundings–stations 01 to 34.

Code : Two groups of 6 letters for each station :—

$D_1\ V_1\ D_2\ V_2\ D_3\ V_3$ $D_4\ V_4\ D_5\ V_5\ D_6\ V_6$

$D_1\ D_2\ D_3\ D_4\ D_5\ D_6$ Indicates the direction of the wind at the different altitudes.

$V_1\ V_2\ V_3\ V_4\ V_5\ V_6$ Indicates the force of wind at different altitudes.

D_1 and V_1 at 500 metres.
D_2 and V_2 „ 1,000 „
D_3 and V_3 „ 1,500 „
D_4 and V_4 „ 2,000 „
D_5 and V_5 „ 3,000 „
D_6 and V_6 „ 4,000 „

For upper winds the following code is used :

Direction of Wind.

NNE	a	SSW	i
NE	b	SW	j
ENE	c	WSW	k
E	d	W..	l
ESE	e	WNW	m
SE	f	NW	n
SSE	g	NNW	o
S	h	N	p

Metres per second :— *Speed of Wind.*

0	a	26	n
2	b	28	o
4	c	30	p
6	d	32	q
8	e	34	r
10	f	36	s
12	g	38	t
14	h	40	u
16	i	42	v
18	j	44	w
20	k	46	y
22	l	48	z
24	m		

Letter x denotes missing observations.

(2) Observations at 13 h.

Parti (i)—Stations 01 to 34.

Station number (two figures) :—BBBDD FWTT βbb

Stations 51 to 55.

Station number (two figures) :—BBBDD FWTTC

Part (ii)—Wind soundings in the same code as at 7h. (stations 01 to 34 only).

(3) OBSERVATIONS AT 1 H. AND 18 H. (Stations 01 to 34 only).

Part (i)—Station number (two figures):—

BBBDD FWTT βbb

Part (ii)—Wind soundings in same code as at 7h.

NOTE.—After the data groups in the 1h. message follows a forecast for the day "*en clair*," based on the 18h. observations of the previous evening.

The telegrams commence by the words:—

Météo France.

The groups of figures and the groups of letters for each station are preceded by a group of two figures indicating the station.

Missing stations are shown by five x's—x x x x x preceded by the number of the station.

Groups of figures are given for the following stations:—

01	Rochefort.	15	Paris (Dugny).	33	Privas.
02	Biarritz.	18	Rennes.	34	Romilly.
03	Bordeaux.	19	Strasbourg.	51	Zurich.
04	Brussels.	21	Toulouse.	52	Berne.
07	Dijon.	22	Tours.	53	Geneva.
08	St. Inglevert (Calais)	27	Alençon.	54	Lugano.
09	Limoges.	28	Amiens.	55	Saentis.
10	Lyons.	29	Cosne.	61	Utrecht.
11	St. Mathieu.	30	Le Havre.	62	Helder.
13	Mayence.	31	Istres.	63	Flushing.
14	Montpellier.	32	Metz.	64	Groningen.

Groups of letters are sent for the following stations:—

03	Bordeaux.	15	Paris.
04	Brussels.	17	St. Pierre Quiberon.
14	Montpellier.	19	Strasbourg.

EUROPEAN WEATHER REPORT.

(Issued from Eiffel Tower (FL) at 11.30 a.m. G.M.T.)

The message commences with the letters "ONM" (Office Nationa Meteorologique, Meteo, Europe) and 40 series of three groups consisting of 2, 5 and 3 figures respectively, giving 7h. observations for the following stations:—

01	Paris.	23	Dantzig.
02	Madrid.	24	Tynemouth.
03	Vienna.	25	Perpignan.
04	Stockholm.	26	Skudesnaes.
05	Stornoway.	27	Corunna.
06	Clermont-Ferrand.	28	Florence.
07	San-Fernando.	29	Fano.
08	Munich.	30	Mahon.
09	Haparanda.	31	Cracow.
10	Thorshavn.	32	Holyhead.
11	St. Mathieu.	33	Berne.
12	Algiers.	34	Helder.
13	Warsaw.	35	Parata.
14	Bronno.	36	London.
15	Blacksod Point.	37	Hamburg.
16	Biarritz.	38	Ile D'Aix.
17	Tunis.	39	Brussels.
18	Prague.	40	Valencia.
19	Vardo.	41	Rabat } Do not yet
20	Seydisfjord.	42	Lisbon } appear in
21	Scilly.	43	Horta } the message.
22	Nice.		

Code :—Station number (two figures) BBBDD FNb.

N = characteristic of barometric tendency, embodying state of the sky.

0 =	positive	tendency	with	sky	clear.	
1 =	,,	,,	,,	,,	¼ covered with cloud.	
2 =	,,	,,	,,	,,	½ ,,	,,
3 =	,,	,,	,,	,,	¾ ,,	,,
4 =	,,	,,	,,	,,	overcast.	
5 =	negative	,,	,,	,,	clear.	
5 =	,,	,,	,,	,,	¼ covered with cloud.	
7 =	,,	,,	,,	,,	½ ,,	,,
8 =	,,	,,	,,	,,	¾ ,,	,,
9 =	,,	,,	,,	,,	overcast.	

b = amount of barometric tendency in half millimetres.
For tendencies 10 to 19 the second figure only is reported, and 33 is added to the wind direction number.
For tendencies 20 to 29 the second figure only is reported, and 67 is added to the wind direction number.

Then follows "*en clair*" (i) the general situation at 7h.; (ii) a detailed forecast for France based on 7h. charts covering the period up to the following morning, and (iii) an indication of the probable weather for the following day.

NOTE.—The order of the stations is such that if only one part of the message is received it may yet give a fair representation of the Chart.

Other meteorological reports are issued as follows :—

(1) Transmitting station—Dugny (call signal, ZM).
Wavelength 1400 m. C.W. (for reports issued at 0645 G.M.T.).
,, 1680 m. C.W. (,, ,, 1155 G.M.T.).

Times of sending, 0645 G.M.T. (Observations at 6h.).
,, ,, 1155 G.M.T. (Observations at 9h., and Paris Observations at 11h.).

Code : Station letters (2) DDFW βbbV W¹n
where DDFW βbb have the same significance as in International Code :—

V = visibility : distance expressed in km. from 0 to 9. The figure 9 expresses a good visibility equal to or better than 9 km.

W ¹ = letters of weather, thus :—

sky cloudless, or less than ¼ covered	b
,, ½ covered	bc
,, ¾ covered	c
,, overcast	o
gloomy	g
threatening appearance	u
wet air without rain	e
rain	r
drizzle	d
snow	s
showers	p
hail	h
squally	q
lightning	l
thunder	t
thunderstorm	tlr
fog	f
wet fog	fe

mist....	m
haze	z
heavy dew	w
hoar frost	x
dry air (humidity less than 60 per cent.)	y
exceptional visibility	v

n = figure for clouds, one or several (as on page 1124). Code 2, Route Weather Reports.

PILOT BALLOON ASCENTS (these are included from certain stations).

Code :—Station letters (2) h DDvvR DDvvR DDvvR
where h = height of cloud layer, thus :—

1 = from 250 to 500 m.
2 = ,, 500 ,, 750 m.
3 = ,, 750 ,, 1,000 m.
4 = ,, 1,000 ,, 1,500 m.
5 = ,, 1,500 ,, 2,000 m.
6 = above 2,000 m.

DD = direction of wind (scale 1 to 32).
vv = velocity of wind in m/sec.
R = characteristic of regularlty in wind, thus :—

0 = regular in speed and direction.
1 = ,, ,, irregular in direction.
2 = irregular in speed, regular in direction.
3 = ,, ,, and direction.
4 = changing direction sharply.
5 = ,, speed sharply.

NOTE.—The message includes a forecast for the whole of France for the morning (at 0800) and afternoon (at 1130) respectively.

STATION IDENTIFICATION LETTERS.
DUGNY MESSAGES.

PA = Paris (Dugny).
AA = Amiens.
AC = Gris-Nez.
AD = Le Crotoy.
AE = Lille.
AG = Rouen.
CC = Alençon.
CD = Chartres.
DA = Chalons s/Marne.
DD = St. Dizier.
EA = Malzeville.
EC = Neufchateau.
EP = Epinal.
FA = Rennes.
FC = Cherbourg.
FD = St. Mathieu.
FE = Lorient.
HA = Dijon.
HC = Luxeuil.
JA = Strasbourg.
JB = Mulhouse.
JF = Mayence.
JI = Thoinville.
JL = Frescaty (Metz).
JK = Bitche.
LA = Tours.
LB = Poitiers.
LC = Chateauroux.
LD = Angers.
MA = Avord.
MB = Limoges.
MC = Clermont-Ferrand.
MD = Puy-de-Dome.
ME = Cosne.
NA = Lyon.
NB = St. Julien en Genevois.
NC = Privas.
OA = Bordeaux.
OB = Biarritz.
OC = Cazaux.
OD = Angouleme.
OF = Rochefort.
OG = La Coubre.
QA = Toulouse.
QC = Pau.
QI = Bagneres de Bigorres.
QL = Pic du Midi.
RA = Montpellier.
RC = Istres.

(2) Transmitting station—Le Bourget (call signal ZM).
Wavelength, 1680 m. C.W.

Times of sending 0730 G.M.T. (Observations at 7h. G.M.T.).
,, ,, 0830 ,, (,, 8h. ,,).
,, ,, 0930 ,, (,, 9h. ,,).
,, ,, 1030 ,, (,, 10h. ,,).
,, ,, 1130 ,, (,, 11h. ,,).
,, ,, 1230 ,, (,, 12h. ,,).
,, ,, 1330 ,, (,, 13h. ,,).
,, ,, 1530 ,, (,, 15h. ,,).
,, ,, 1630 ,, (,, 16h. ,,).

Observations relate to the following stations. The index letter is given in brackets :—Le Bourget (P1), Le Havre (P5), Abbeville (P3), St. Inglevert (P2), Maubeuge (P4), Le Crotoy (AD), Compiègne (CO).

Code: as for British hourly reports, except that the following code is used for present and also past weather :—

00 = sky almost cloudless.	43 = squalls.
01 = sky $\frac{1}{4}$ clouded.	44 = gale.
02 = sky $\frac{1}{2}$ clouded.	45 = gloom.
03 = sky $\frac{3}{4}$ clouded.	46 = ugly, threatening.
04 = overcast, but small amount of blue visible.	49 = thunder and lightning (no rain).
05 = entirely overcast.	78 = drizzle.
17 = slight fog.	81 = rain or showers.
19 = fog.	84 = hail.
20 = wet fog.	87 = sleet.
30 = wet air.	90 = snow.
32 = dust haze.	93 = thunderstorm without hail.
33 = dew.	96 = thunderstorm with hail.
34 = hoar frost.	98 = line squall.

(3 & 4)

Transmitting station	Cherbourg	.... Brest.
Call signal	FUC	.... FUE
Wavelength	2,800 m. C.W.	.... 2,800 m. C.W.
Times of sending	0800 G.M.T.	.... 0810 G.M.T.
,, ,, ...	1400 G.M.T.	.... 1410 G.M.T.
,, ,, ...	1830 G.M.T.	.... 1840 G.M.T.

Observations at .... 7h. 13h. 18h. respectively.

The messages begin, " Meteo Cherbourg " and " Meteo Brest."

OBSERVATIONS AT 7h.

Code : BBBDD FWTTC βbbRR MMnnV pilot ADDVV ADDVV, etc.

OBSERVATIONS AT 13h. AND 18h.

Code : BBBDD FWβbb Vis (visibility as in British Reports).

Observations in Old International Code.

Pilots in Code A 1 = 200 m., 2 = 500 m., 3 = 1,000 m., 4 = 1,500 m. 5 = 2,000 m., 6 = 3,000 m., 7 = 4,000 m., 8 = 5,000 m.

(5 & 6)

Transmitting station	Porqueroles (near Toulon).	Toulon.
Call signal	FUQ	.... FUT
Wavelength	1,350 m. spark	1,350 m. spark.
Times for sending	0915 G.M.T.	1900 G.M.T.
Observations at	0700 G.M.T.	1800 G.M.T.

The messages begin with words, " Meteo Mourillon."

0700 observations from 1, Cap Bear ; 2, Cette ; 3, Aubagne ; 4, Toulon ; 5, St. Raphael ; 6, Ajjacio.

Code : BBBDD FWTTC βbbRR MMnmu

Pilots from : 1, Aubagne ; 2, St. Raphael.

Code : DDVV DDVV for heights 500, 1,000, 1,500, 2,000 metres.

1800 observations from same stations as 0915 message.

Code : BBBDD FWTTC βbb

Pilots as for 0700.

FRENCH OCEANIA

The Papeete station (Tahiti Is.) transmits every day, including holidays, on the wavelength of 600 metres, two meteorological reports, one at 11 a.m. and the other at 11 p.m. (G.M.T.), which are made up as follows:—

I.

The reports contain the date of the report of the meteorological station of Point Venus, followed by a group of 8 figures in normal code: BBBDDFWS.

The report is preceded by the following signal: "Tahiti observatoire."

II.

Notice to navigators concerning alterations of lightship or light buoys, the presence of derelicts, and the disappearance of light buoys or important buoys, and any other information in regard to navigation, will be added, as occasion arises, in the report. It will be sent out in French and English.

III.

The reports will be transmitted three times in succession; the first time transmission will be made rapidly, the second and third times slowly.

IV.

A safety signal will be transmitted to ships at any hour of the day or night, repeated at short intervals ten times on full power: Tahiti T.T.T., followed by advice of cyclones, typhoons or derelicts, or any sudden changes in the position or form of fixed obstructions or of land marks. The message will be repeated three times with intervals of ten minutes.

There is a meteorological station on a small scale in the New Hebrides on the Island of Iririki in Vila Harbour, and the observations recorded are communicated to the Commonwealth Meteorologists at Melbourne, Australia. and rainfall to British Meteorological Office, London.

GERMANY

The Nauen high-power station at present broadcasts time signals at noon and midnight (G.M.T.) 0100 and 1300 standard mean time on a wavelength of 3,100 m. undamped musical in accordance with the International Time Conference.

This station further transmits at 0900 and 1940 (G.M.T.) "*International Weather Reports*" from observations at 7h. and 18h. respectively.

The observations for 0700 are sent at 0900 in the code

BBBDD FWTTC βbbRR MMmmu

and the observation for 1800 are sent at 1940 in the code

BBBDD FWTTW[1] where W[1] refers to past weather.

The stations used are Borkum, Keitum, Hamburg, Swinemunde, Neufahrwasser, Memel, Aachen, Hanover, Berlin, Dresden, Breslau, Karlsruhe, Frankfürt, Munich, Vienna.

Since May, 1919, the high-power wireless station of Nauen, on a request from a British source of the then Armistice Commission, sends out twice daily (10 a.m. and 8.40 p.m.) on a wavelength of 4,700 m. undamped, for reception in England and France, a collective telegram of German weather observations drawn up by the German Marine Observatory, Hamburg.

(1) INLAND METEOROLOGICAL SERVICE.

The weather reports of the German Marine Observatory are forwarded direct by wireless from Hamburg to the Chief Wireless Station of the Chief Telegraph Office in Berlin, whence they are at present sent by distant control and wireless telegraphy four times daily *via* the main wireless station at

Königs Wusterhausen. The "Upper Air" reports of the Lindenburg Aeronautical Observatory are received through the telephone by the main wireless station of Königs Wusterhausen and are reforwarded thence by wireless.

Transmitting station.—Königs-Wusterhausen (call signal LP).

Wavelength, 3,200 m. C.W.

Times of sending.—6035, 0940, 1550 (G.M.T.).

The messages are synoptic reports of aircraft and captive balloon observations made at Lindenberg and coded according to the Lindenberg code.

They are in two parts:—

(i) Wind in the upper atmosphere.

(ii) Captive-balloon observations.

LINDENBERG CODE.

The code for (i) is as follows:—

ZZwVβ h_1h_1DDv h_1h_1DDv addS_2

where ZZ = time in whole hours from 00 to 23.

(00 = 23 h. (G.M.T.); 01 = 24 h. (G.M.T.); 02 = 1 h. (G.M.T.) etc.)

w = present weather in old international code.

V = horizontal visibility, the scale being:

0 = less than 20 metres.		5 = up to	1 km.
1 = up to	50 metres.	6 = ,,	5 ,,
2 = ,,	100 ,,	7 = ,,	10 ,,
3 = ,,	200 ,,	8 = ,,	20 ,,
4 = ,,	500 ,,	9 = ,,	50 ,,

β = barometric tendency during 3 hours previous to transmission of report.

0 = no change		(less than 0·5 mm.).
1 = falling slightly		(0·5-1·4 mm.).
2 = ,,	gradually	(1·5-2·4 mm.).
3 = ,,	rapidly	(2·5-3·4 mm.).
4 = ,,	very rapidly	(greater than 3·4 mm.).
5 = rising slightly		(0·5-1·4 mm.).
6 = ,,	gradually	(1·5-2·4 mm.).
7 = ,,	rapidly	(2·5-3·4 mm.).
8 = ,,	very rapidly	(greater than 3·4 mm.).
9 = unsteady or impossible to report.		

h_1h_1 = altitude above sea-level in hundreds of metres (00 = ground level).

DD = direction of wind at each height (scale 0-32, international code).

v = single figure for wind velocity
for velocities 10 to 19, 33 is added to DD.
,, ,, 20 to 29, 67 ,, ,,
,, ,, above 29, the velocity is given in words (000 = calm.)

addS_2 If the final group has only 4 figures it will be a cloud symbol, code, a 1 = Ci; 2 = Ci-St; 3 = Ci-Cu; 4 = A-Cu.

dd = direction of cloud (0-32, international code)

$$S_2 = \frac{\text{angular velocity}}{\text{altitude}}$$

The code for (ii) is

h_1h_1TTT HHDDv h_1h_1TTT HHDDv ZZwVβ

where

h_1h_1 = height above mean sea-level in hundreds of metres.

TTT = temperature in tenths of degrees centigrade

HH = relative humidity as % (98 = 100%; 99 = no report).

A special wireless system exclusively for the use of aviation does not exist. The radio traffic for the purposes of airship traffic is at present

restricted to the forwarding of single telegrams (weather reports, starting and landing reports) by the wireless stations of the Imperial wireless system. The weather reports of the German Marine Observatory and the "altitude" observations (Hohenbeobachtungen) of the Lindenberg Aeronautical Observatory broadcasted by the Königs Wusterhausen chief wireless station, contribute to the safety of aerial navigation.

Ship Weather Service.

Since the 1st January, 1920, the chief wireless station of Norddeich broadcasts daily after the Nauen time signal at one o'clock p.m. on a wave of 600 m. (musical spark) a weather telegram giving the state of the weather and a weather forecast for the next 24 hours, destined for ships in the North Sea. Norddeich also sends, as required and on the same wavelength, storm warnings which are repeated at 6 p.m. A similar news service for the Baltic coastal territory has recently been instituted experimentally at the wireless coast stations of Swinemunde and Pillau. *The supply, against payment, of weather reports by coast stations to passing ships, at the request of the latter, has not again been instituted.*

Important News for Mariners: Ice Reports.

The coast stations of Norddeich, Swinemunde and Pillau, send out as required and by wireless telegraphy "Important news for mariners" regarding the breaking away of light ships, etc. The messages, which are sent on a wavelength of 600 m. (musical spark), are transmitted three times immediately after they have been received at the coast station, and as long as may be necessary, are repeated three times after the weather telegrams. The Nauen high-power station sends ice reports in cipher after the weather telegrams. The same reports, however, are sent out in plain language by the wireless coast stations of Norddeich and Swinemunde after the weather telegram.

Borkum KBM (position 53° 35′ N.; 6° 40′ E.) sends out at 0300, 0700, 1100, 1500, 1900, 2300 G.M.T. on 600 m. wavelength warnings respecting mines.

GIBRALTAR

Transmitting station: Gibraltar (call signal BWW).

Wavelength: 4,800 m. C.W.

Times of sending: (G.M.T. 0730) (observations at 21h and 7h).
(G.M.T. 1840) (,, ,, 13h and 18h).

Code for 0730 report
BBBDD FFWTT BBBDD FFWTT 999RR MMmmu

Code for 1840 report
BBBDD FFWTT 999UC BBBDD FFWTT bbuMM

Note.—Barometer in inches and hundredths; wind-force (2 fig) Beaufort scale 0-12; rainfall in inches and hundredths.

GREAT BRITAIN

Collective data messages are issued four times daily, from the Air Ministry, picked up by Aberdeen and retransmitted. Information in these synoptic messages include temperature, humidity and visibility observations.

On and after September 1st, 1921, the synoptic reports* for British stations, issued by wireless telegraphy, will be as follows:—

* A synoptic chart gives a general or "bird's-eye" view of the weather at a certain definite time over a large area.

Air Ministry, London.

Call sign: G.F.A.

Wavelength: 1,400m. continuous wave.

Times of issue:	0200 (G.M.T.)	(Observations of	0100 G.M.T.)
,, ,,	0800 ,,	,, ,,	0700 ,,
,, ,,	1400 ,,	,, ,,	1300 ,,
,, ,,	1900 ,,	,, ,,	1800 ,,

Aberdeen.

Call sign: B.Y.D.

Wavelength: 3,300 m. continuous wave.

Time of issue: 0830 (G.M.T.) (Observations of 0700 (G.M.T.)

The reports will be sent in the code recommended at the third meeting of the Commission for Weather Telegraphy, held in London in November, 1920. The messages will consist of three parts:—

i. Surface observations and cloud reports.
ii. Upper winds (speeds in miles per hour for the present).
iii. Upper air temperatures and humidities.

In the first part of the message the index figures for each station will be followed by groups of five figures, giving the surface observations and the cloud observations for the station.

In the second part of the message the index figures for each station will be followed by three groups of five figures, giving the upper wind for that station at three selected heights.

In the third part of the message the index figures for each station will be followed by a number of five-figure groups giving the temperature and humidity and pressure at different heights.

For security the second part of the message will be preceded by the word "PILOT," and the third part of the message by the word "TEMP."

NEW INTERNATIONAL CODE.

If I_1I_1 I_2I_2 I_3I_3 etc., are the index groups of stations, then the symbolic form of the messages will be:—

I_1I_1 BBBDD FwwTT cbWVH ALaNh RRjjr C_1ddVV.
I_2I_2 BBBDD, etc.
I_3I_3 BBBDD, etc.
Pilot I_1I_1 $h_1$ddvv $h_1$ddvv $h_1$ddvv
I_2I_2, etc.
I_3I_3, etc.
Temp. I_1I_1 BBTTH, etc.
I_2I_2 BBTTH, etc.
I_3I_3 BBTTH, etc.

A hyphen - (Morse signal ▬ ● ● ● ▬) will be used in the place of any missing figure.

BBB = Barometer in millibars and tenths (initial 9 or 10 omitted).

DD = Direction of the wind near the ground on the scale 01-32 (Code 1).

F = Force of the wind on the Beaufort scale. (Forces above 10 reported as 9 in the telegrams with the actual force in a word at the end, *e.g.*, force 10 is reported at the end as "storm ten"; force 11 as "storm eleven").

ww = The actual weather at the time of observation, with which is combined, whenever possible, the general character of the weather (Code 2).

TT = Temperature of the air in whole degrees Fahrenheit.

c = Characteristic of barometric tendency during the period of three hours preceding the time of observation (Code 3).

b = Amount of barometric tendency in the same period of three hours expressed in half-millibars. For tendencies 10-19, the *second* figure only is reported, and 33 is added to the wind direction number. For tendencies 20-29 the second figure only is reported, and 67 is added to the wind direction number. Tendencies greater than 29 are reported as 29 (Code 4).

W = The weather in the interval since the preceding time of report (Code 5).

V = Visibility or distance at which objects can be seen in daylight (or at which lights can be seen at night) (Code 6).

H = Relative humidity of the air (Code 7).

A = Form of *predominating cloud lowest* in the scale of cloud forms (Code 8).

L = Amount of sky (0-10) covered by cloud of form A and of all forms of the same layer as A, if "a" refers to a different layer.

a = Form of *predominating cloud highest* in the scale of cloud forms when more than one type of cloud exists (Code 8).

N = Total amount of sky covered with cloud (scale 0-10).

h = Height of base of lowest cloud present (Code 9).

RR = Rainfall in whole millimetres (Code 10).

jj = The meaning of the letters "jj" varies with the time of report, and between coast stations and inland stations. From coast stations figures giving the state of the sea and the visibility towards the sea are inserted for "jj." From inland stations in the reports at 0700, the minimum temperature during the night is inserted for "jj," and for reports at 1800 the maximum temperature during the day is inserted for "jj."

r = Time of commencement of rainfall (precipitation) (Code 11).

C_1 = Form of cloud observed by nephoscope for special cloud reports (Code 8).

dd = Direction of the wind in the upper air on the scale 01-36 (*i.e.*, degrees from north divided by 10 and rounded off to the nearest whole number) (00 - calm).

VV = The relative speed of clouds as determined by nephoscope, and such that if "h" is the height of the cloud in metres, the actual speed "vv" in kilometres per hour is obtained from the equation—

$$vv = \frac{h}{1000} \times VV$$

h_1 = Height at which the upper wind is reported (Code 13).

dd = Direction of the wind in the upper air on the scale 01-36.

vv = Speed of the wind in the upper air in miles per hour.

NOTE.—The speed of the upper air will continue for the present to be given in m.p.h., as the introduction of kilometres per hour involves certain changes which it has not yet been possible to carry out.

BB = Barometer in whole millibars (initial 9 or 10 omitted).

H_1 = Height at which upper air temperature and humidity are reported (Code 14).

The necessary codes are given in the attached appendix.

The list of stations, with the latitude and longitude and approximate height above mean sea level, is given below. Stations which will be used at present for surface observations are printed in capital letters.

Coast station = (S), Land station = (L).

Index No.		Latitude.	Longitude.	Height above Mean Sea Level.
				Feet.
01	LERWICK (S)	60° 09′	1° 08′W.	54
02	Orkney (S)	58° 56′	3° 11′	500
03	STORNOWAY (S)	58° 11′	6° 22′	51
04	Wick (S)....	58° 27′	3° 06′	81
05	Castlebay (S)	56° 57′	7° 29′	37
06	Nairn (L)	57° 36′	3° 52′	82
07	ABERDEEN (S)	57° 10′	2° 06′	46
08				
09	Leuchars (L)	56° 23′	2° 53′	20
10	MALIN HEAD (S)	55° 23′	7° 24′	208
11	RENFREW (L)	55° 52′	4° 24′	? 40
12	Leith (S)....	55° 59	3° 13′	30
13	Eskdalemuir (L)	55° 19′	3° 12′	794
14	Goswick (S)	55° 42′	1° 54′	15
15	TYNEMOUTH (S)	55° 01′	1° 25′	71
16				
17				
18				
19				
20	BLACKSOD POINT (S)	54° 06′	10° 04′	327
21				
22	Donaghadee (S)....	54° 38′	5° 32′	37
23				
24				
25	Flamborough (S)	54° 07′	0° 05′	190
26				
27				
28				
29				
30				
31	Birr Castle (L)	53° 06′	7° 56′	175
32	Baldonnel (L)	53° 18′	6° 26′	280
33	HOLYHEAD (S)	53° 18′	4° 39′	15
34	Liverpool (S)	53° 24′	3° 04′	188
35	Shotwick (L)	53° 14′	3° 00′	16
36	Manchester (L)	53° 26′	2° 13′	98
37	Howden (L)	53° 47′	0° 52′	19
38	Spurn Head (S)	53° 34′	0° 07′E.	26
39				
40				
41				
42	Castle Bromwich (L)	52° 31′	1° 48′W.	270
43	Nottingham (L)	52° 56′	1° 09′	82
44	CRANWELL (L)	53° 02′	0° 31′	256
45	YARMOUTH (S)	52° 35′	1° 43′E.	10
46	Pulham (L)	52° 24′	1° 14′	125
47	Felixstowe (S)	51° 56′	1° 20′	21
48				
49				
50	VALENCIA (S)	51° 56′	10° 15′W.	30
51	Roche's Point (S)	51° 47′	8° 15′	32
52	PEMBROKE (S)	51° 41′	5° 11′	149
53				
54	ROSS-ON-WYE (L)	51° 54′	2° 34′	202

Index No.		Latitude	Longitude	Height above Mean Sea Level.
				Feet.
55	Benson (L)	51° 37′	1° 07′	186
56	Larkhill (L)	51° 11′	1° 48′	470
57	Andover (L)	51° 12′	1° 31′	250
58	Farnborough (L)	51° 15′	0° 45′	234
59				
60	Kew (L)	51° 28′	0° 19′	18
61	CROYDON (L)....	51° 21′	0° 07′	242
62	Biggin Hill (L)	51° 19′	0° 03′E.	610
63	Clacton (S)	51° 47′	1° 09′	54
64	Shoeburyness (S)	51° 32′	0° 47′	11
65	Grain (S)	51° 27′	0° 43′	7
66	Lympne (L)	51° 05′	1° 01′	340
67				
68				
69				
70	SCILLY (S)	49° 58′	6° 18′W.	131
71	Falmouth (S)	50° 09′	5° 04′	167
72	Plymouth (S)	50° 22′	4° 08′	147
73	Portland (S)	50° 32′	2° 27′	19
74	CALSHOT (S)	50° 49′	1° 18′	12
75	Beachy Head (S)	50° 44′	0° 15′E.	525
76	Dungeness (S)	50° 55′	0° 58′	21
77	GUERNSEY (S) (1 a.m. and 1 p.m.) or	49° 26′	2° 33′W.	?
78	JERSEY (S) (7 a.m. and 6 p.m.)	49° 12′	2° 11′	25

CODE 1 (DD).

Code for reports of wind direction to indicate the "tens" figure in the Barometric Tendency :—

Direction.	Barometer Tendencies of 9 or less.	Barometer Tendencies of 10-19.	Barometer Tendencies of 20-29.
	Code numbers for wind direction.		
Calm	00	33	67
N. by E.	01	34	68
N.N.E.	02	35	69
N.E. by N.	03	36	70
N.E.	04	37	71
N.E. by E.	05	38	72
E.N.E.	06	39	73
E. by N.	07	40	74
E.	08	41	75
E. by S.	09	42	76
E.S.E.	10	43	77
S.E. by E.	11	44	78
S.E.....	12	45	79

Direction.	Barometer Tendencies of 9 or less.	Barometer Tendencies of 10-19.	Barometer Tendencies of 20-29.
	Code numbers for wind direction.		
S.E. by S.	13	46	80
S.S.E.	14	47	81
S. by E.	15	48	82
S.	16	49	83
S. by W.	17	50	84
S.S.W.	18	51	85
S.W. by S.	19	52	86
S.W.	20	53	87
S.W. by W.	21	54	88
W.S.W.	22	55	89
W. by S.	23	56	90
W.	24	57	91
W. by N.	25	58	92
W.N.W.	26	59	93
N.W. by W.	27	60	94
N.W.	28	61	95
N.W. by N.	29	62	96
N.N.W.	30	63	97
N. by W.	31	64	98
N.	32	65	99

CODE 2 (ww).

Code for weather at actual time of observation and general character of weather :—

Fine or Fair (Cloud 0-5)	Cloud decreasing	00
	No apparent change	01
	Cloud increasing	02
	Fine or fair, precipitation within sight....	03
	With solar or lunar halo	04
	After fog or mist (or dust storm)....	05
	After rain or drizzle	06
	Fine or fair, after snow, sleet or hail	07
	With or after thunder and lightning in neighbourhood	08
	After thunderstorm	09
Cloudy or Overcast (Cloud 6-10)	Cloud decreasing	10
	No apparent change	11
	Cloud increasing	12
	Cloudy or overcast, precipitation within sight....	13
	With solar or lunar halo	14
	After fog or mist (or dust storm)....	15
	After rain or drizzle	16
	Cloudy or overcast after snow, sleet or hail	17
	With or after thunder and lightning in neighbourhood	18
	After thunderstorm	19

Weather	Description		No.
Fog or Mist	Just begun	Clear in zenith	20
		Apparently overcast....	21
	Intermittent....	Clear in zenith	22
		Apparently overcast....	23
	For some time becoming thinner	Clear in zenith	24
		Apparently overcast....	25
	For some time	Clear in zenith	26
		Apparently overcast....	27
	For some time becoming thicker	Clear in zenith	28
		Apparently overcast....	29

Weather	Description		No.
Passing Showers....	Slight with	rain	30
	,, ,,	hail or rain and hail	31
	,, ,,	sleet	32
	,, ,,	snow	33
	Heavy with	rain becoming better	34
	,, ,,	rain	35
	,, ,,	rain becoming worse	36
	,, ,,	rain or rain and hail	37
	,, ,,	sleet	38
	,, ,,	snow	39

Weather	Description		No.
Drizzle	Slight	occasional	40
	,,	continuous	41
	,,	but increasing	42
	Moderate	but decreasing	43
	,,	occasional	44
	,,	continuous	45
	,,	but increasing	46
	Thick	but decreasing	47
	,,	occasional	48
	,,	continuous	49

Weather	Description		No.
Rain	Slight	occasional	50
	,,	continuous	51
	,,	but increasing	52
	Moderate	but decreasing	53
	,,	occasional	54
	,,	continuous	55
	,,	but increasing	56
	Heavy	but decreasing	57
	,,	occasional	58
	,,	continuous	59

Weather	Description		No.
Snow, or Snow and Hail	Slight	occasional	60
	,,	continuous	61
	,,	but increasing	62
	Moderate	but decreasing	63
	,,	occasional	64
	,,	continuous	65
	,,	but increasing	66
	Heavy	but decreasing	67
	,,	occasional	68
	,,	continuous	69

Weather	Intensity	Description	Code
Sleet, or Rain and Snow	Slight	occasional	70
	,,	continuous	71
	,,	but increasing	72
	Moderate	but decreasing	73
	,,	occasional	74
	,,	continuous	75
	,,	but increasing	76
	Heavy	but decreasing	77
	,,	but occasional	78
	,,	continuous	79
Hail, or Rain and Hail	Slight	occasional	80
	,,	continuous	81
	,,	but increasing	82
	Moderate	but decreasing	83
	,,	occasional	84
	,,	continuous	85
	,,	but increasing	86
	Heavy	but decreasing	87
	,,	occasional	88
	,,	continuous	89
Thunderstorm	Slight	without hail	90
	,,	with hail	91
	Moderate	without hail	92
	,,	with hail	93
	Heavy	without hail (without gale)	94
	,,	with hail ,, ,,	95
	,,	without hail (with gale)	96
	,,	with hail ,, ,,	97
Line Squall	Line squall	without hail	98
	,, ,,	with hail	99

CODE 3 (c).

Code for Characteristic of Barometric Tendency.

Code	Symbol	Characteristic	
0 =	o or +	Steady or rising	The barometer is now higher than, or the same as, three hours ago.
1 =	+ o	Rising then steady	
2 =	+ −	Rising then falling	
3 =	− + or o +	Falling or steady then rising	
4 =	Unsteady	Unsteady but rising	
5 =	−	Falling	The barometer is now lower than, or the same as, three hours ago.
6 =	− o	Falling then steady	
7 =	− +	Falling then rising	
8 =	o − or + −	Steady or rising then falling	
9 =	Unsteady	Unsteady but falling	

CODE 4 (b).

Code for Amount of Barometric Tendency.

Only the units figure of the amount (half-millibars per three hours is reported, and 33 is added to the wind direction number for tendencies of 10-19. Similarly, 67 is added for tendencies of 20-29. Tendencies above 29 are given as 29.

The "characteristic" indicates whether the tendency is positive or negative.

CODE 5 (W).

Code for Past Weather.

Without precipitation	0 = Fair or fine (*b* or *bc*).
	1 = Cloudy.
	2 = Overcast continuously.
	3 = Fog or mist.
	4 = Thick fog.
Precipitation	5 = Passing showers.
	6 = Rain or drizzle.
	7 = Snow or sleet.
	8 = Hail or rain and hail.
	9 = Thunderstorm.

In using this code the largest number is taken which describes a feature of the past weather not already reported by the two figures for "present weather and general character." In any case in which the two figures "for present weather and general character" describe fully the past weather also, then the appropriate single past weather figure is reported in confirmation, *e.g.*, in the case of heavy continuous rain without fog or mist the present weather figures would be 59 and the past weather figure would be 6.

CODE 6 (V).

Code for Visibility.

Code Number.			
0	Objects not visible at	50 metres.	
1	,, ,, ,,	200 ,,	
2	,, ,, ,,	500 ,,	
3	,, ,, ,,	1,000 ,,	
4	,, ,, ,,	2,000 ,,	
5	,, ,, ,,	4,000 ,,	
6	,, ,, ,,	10,000 ,,	
7	,, ,, ,,	20,000 ,,	
8	,, ,, ,,	50,000 ,,	
9	,, visible at	50,000 ,,	or above.

CODE 7 (H).

Code for Relative Humidity.

Code Figure.	Relative Humidity.
0	95–100 per cent.
9	90– 94 ,,
8	80– 89 ,,
7	70– 79 ,,
6	60– 69 ,,
5	50– 59 ,,
4	40– 49 ,,
3	30– 39 ,,
2	20– 29 ,,
1	10– 19 ,,

CODE 8 (A, a, C_1).

Code for Form of Cloud.

Code Number.	Form of cloud.
1	Ci.
2	Ci. St.
3	Ci. Cu.
4	A-Cu.
5	A.St.

6	St. Cu. (Mammato-Cumulus is reported by the figures for the type of cloud in which the mamma!o form occurs).
7	Nb.
8	Cu. or Fr. Cu.
9	Cu. Nb.
0	St. or Fr. St.

CODE 9 (h).

Code for height of base of Lowest Cloud.

Code Number.		Height of Base of Cloud.
0	0– 50 metres	0– 150 feet.
1	50– 100 ,,	150– 300 ,,
2	100– 200 ,,	300– 600 ,,
3	200– 300 ,,	600–1,000 ,,
4	300– 600 ,,	1,000–2,000 ,,
5	600–1,000 ,,	2,000–3,000 ,,
6	1,000–1,500 ,,	3,000–5,000 ,,
7	1,500–2,000 ,,	5,000–6,500 ,,
8	2,000–2,500 ,,	6,500–8,000 ,,
9	No low cloud	No low cloud.

CODE 10 (RR).

Code for Amount of Rainfall.

Amounts are given in whole millimetres, but for amounts 0 1 0 0.6 mm., the following code is used :—

91 = 0.1.
92 = 0.2.
93 = 0.3.
94 = 0.4.
95 = 0.5.
96 = 0.6.
97 = Some rain but not measurable.
98 = More than 90 millimetres.
99 = Measurement impossible or un eliable

CODE 11 (r).

Code for Time of Beginning of Rainfall.

0 = No rain.
1 = 0–1 hours before the time of observation.
2 = 1–2 ,, ,, ,,
3 = 2–3 ,, ,, ,,
4 = 3–4 ,, ,, ,,
5 = 4–5 ,, ,, ,,
6 = 5–6 ,, ,, ,,
7 = 6–8 ,, ,, ,,
8 = 8–10 ,, ,, ,,
9 = Above 10 ,, ,, ,,
– = No observation.

CODE 12 (S).

Code for State of Sea and Character of Swell.

0 = No swell .... 1 = Moderate swell 2 = Heavy swell	Calm or slight sea.
3 = No swell .... 4 = Moderate swell 5 = Heavy swell	Moderate sea.

6 = Rather rough sea.
7 = Rough sea.
8 = Very rough sea.
9 = Mountainous sea.

CODE 13 (h_1).

Code for Height of Upper Wind.

Code Number.	Height. International Specification.	Corresponding height used for British Reports.
1	200 metres	1,000 feet.
2	500 ,,	2,000 ,,
3	1,000 ,,	3,000 ,,
4	1,500 ,,	5,000 ,,
5	2,000 ,,	7,000 ,,
6	3,000 ,,	10,000 ,,
7	4,000 ,,	13,000 ,,
8	5,000 ,,	17,000 ,,
9	6,000 ,,	20,000 ,,

CODE 14 (H_1).

Code for Height of Upper Air Temperature and Humidity.

The figure groups refer to the following heights and are sent in fixed order.

Heights.
(International Specification.)

Height	
200 metres	Above ground.
500 ,,	Above ground.
1,000 ,,	Above mean sea level.
1,500 ,,	Above mean sea level.
2,000 ,,	Above mean sea level.
2,500 ,,	Above mean sea level.
3,000 ,,	Above mean sea level.
4,000 ,,	Above mean sea level.
5,000 ,,	Above mean sea level.
6,000 ,,	Above mean sea level.

HOURLY REPORTS.

These are now issued in the revised code forms adopted by the International Commission for Weather Telegraphy at the meetings in London in September, 1921.

Hourly reports are issued daily from the Air Ministry, Sundays included at 35 minutes past each hour from 0735 to 1635 (G.M.T.) by wireless telegraphy (giving the results of observations taken 35 minutes previously) as follows :—

Call sign .. .. GFA.
Wavelength .. .. 1680 m. (c.w.)

After the call sign GFA comes the word " METEOR," indicating that a meteorological message is being transmitted. This is followed by one four-figure group, giving the hour (G.M.T.) at which the observations were made : this time group will be followed by a series of figure groups indicating the stations and conditions thereat. The group giving the index number will consist of two figures (three figures in the case of a station reporting sea visibility). This group will be followed by groups of five figures giving the meteorological conditions at the stations :—

Index Figures.	*Station.*
61	Croydon.
62	Biggin Hill.
66	Lympne.
75	Beachy Head.
76	Dungeness.

In the case of DUNGENESS (76) only one group will be sent, including the index figures and the Channel visibility there, while in the case of Lympne the last figure of the first group will give the Channel visibility from HYTHE.

The word "BOTLEY" when it occurs in a message is followed by a statement in plain language of the conditions on the North Downs (Botley Hill), as viewed from Biggin Hill, when such a statement adds material information to that contained in the rest of the message.

At the end of the messages issued at 0835, 1135 and 1435 a short forecast will be given in plain language of the meteorological changes anticipated in S.E. England in the period of daylight following the time of issue.

This will begin with the word "FORECAST."

The complete results of a pilot balloon ascent at Croydon or Lympne, when available, will be given at the end of the messages at 0735, 1135 and 1335. This part of the message will be preceded by the index figures of the station and by the four figure index group 49tt—where tt = hour of ascent (G.M.T.).

The groups following the index group will be in the form $h_1$ddvv where h_1 is the height according to the following scale :—

1 refers to a height of		200	metres or	500	feet.
2	,,	,,	500	,,	1,500	,,
3	,,	,,	1,000	,,	3,000	,,
4	,,	,,	1,500	,,	5,000	,,
5	,,	,,	2,000	,,	7,000	,,
6	,,	,,	3,000	,,	10,000	,,
7	,,	,,	4,000	,,	13,000	,,
8	,,	,,	5,000	,,	16,000	,,
9	,,		6,000	,,	20,000	,,

dd is the direction of the wind on the scale (01—36) at the height h_1, *i.e.*, degrees from North divided by 10 and rounded off to the nearest whole number (00 = calm).

vv is the speed of the wind in miles per hour.

NOTE.—If no ascent is possible before 0735, the results of a later ascent will be added to the message at 0935, if then available.

Additional Reports from Stations outside S.E. England, from the Azores and from Ships at Sea.

(*a*) Reports from stations which are received too late for inclusion in the general synoptic messages issued by wireless telegraph from the Air Ministry at 0800 and 1400 will be added to the 0835 and 1435 route reports after the forecast.

(*b*) Reports from Valencia, Plymouth and Calshot for 1000 G.M.T. will be added at the end of the 1035 route report.

The above reports will be sent in the following (normal) code :—

BBBDD FwwTT cbWVH ALaNh RRmmr for land stations.
BBBDD FwwTT cbWVH ALaNh RRSV$_s$r for coast stations.

(*c*) The 0700 observations (3 groups for each station) from the Azores (Horta and Ponta Delgada) will be added to the first route report sent after the reception of the observations at the Meteorological Office, London. The groups will be preceded by the words "Horta" and the letters "P.D." respectively.

(*d*) In the same way reports received from ships at sea will be added to

the next hourly route report issued after these reports have been received. They will be sent in the code

$QLLLx_1$ $llllx_2$ $BBDDx_3$ $FVKdx_4$ $wwGGx_5$
$TTttx_6$ $CNWrx_7$ $y_1y_2y_3y_4y_5$

CODES.

The standard form is I_1I_1 (V_s) wwVhL $NDDFW_1$

This is used for all stations for observations at all times except 0700, 1000, 1300 and 1600.

For observations at 0700, 1000, 1300 and 1600 two forms are used :—

(*a*) *At non-synoptic stations* (Biggin Hill (62) and Beachy Head (75) the same code is used as at other hours, with the addition of a fourth group represented symbolically by $CddF_1S$. Thus for these stations reports at 0700, 1000, 1300 and 1600 will be in the form

I_1I_1 (V_S) wwVhL NDDFW $CddF_1S$

(*b*) *At synoptic stations* (Croydon (61) and Lympne (66)) the general code is used with the addition of the same group, $CddF_1S$. Thus for these stations the reports at 0700, 1000, 1300 and 1600 will be in the form

I_1I_1 (V_S) BBBDD FwwTT cbWVH ALaNh $CddF_1S$

The meaning of the symbols is as follows :—

I_1I_1 = index figures of station.

V_S = visibility towards the sea (*see* Code 6).

BBB = barometer in millibars and tenths (initial 9 or 10 omitted). The values refer to sea-level and include all corrections for index error, temperature and gravity.

DD = direction of the wind near the ground on the scale (01 to 32) in which 08 = East, 16 = South, etc., 00 = calm.

F = force of the wind on the Beaufort Scale.

ww = the actual weather at the time of observation, with which is combined, whenever possible, the general character of the weather (*see* Code 2 New International Code above).

TT = temperature of the air in whole degrees Fahrenheit.

c = characteristic of barometric tendency during the period of three hours preceding the time of observation.

b = amount of barometric tendency expressed in half millibars. For tendencies 10 to 19 the *second* figure only is reported and 33 is added to the wind direction number. For tendencies greater than 29 the second figure only is reported and 67 is added to the wind direction number. Tendencies greater than 29 are reported as 29.

W = the weather in the interval since the time of preceding report (*see* Code 5 New International Code above).

V = visibility, or distance at which objects can be seen in daylight (*see* Code 6).

H = relative humidity of the air.

A = form of *predominating cloud lowest* in the scale of cloud forms (*see* Code 2).

L = amount of sky (scale 0 to 10) covered by cloud form A and all forms of the same layer (*i.e.*, low, medium or high), as A, if "a" refers to a different layer.

a = form of *predominating cloud highest* in the scale of cloud forms when more than one type of cloud exists (*see* Code 2).

N = *total amount of sky covered with cloud* (scale 0 to 10).

h = height of base of lowest cloud present (*see* Code 9 New International Code above).

C = form of cloud to which ddF_1 refers (*see* Code 2).

dd = direction of motion of low cloud on the scale 01 to 36.

F_1 = approximate speed of low cloud (*see* Code 1).

S = the state of the sea (*see* Code 6).

The following is a specimen message :—

G.F.A.	Meteor.	1100	G.M.T.		
61	12644		91722		
62	11738		02023		
666	27200		01814		
755	15520		02034		
766					
61	4910	12215	22417	32520	42425
		52427	62330		

Forecast clouds below 500 feet inland. Slight rain probable. Cloud lifting and visibility improving on coast with freshening S.W. winds.

The last part of the message gives the result of a pilot balloon ascent as follows :—

Place : Croydon. *Time :* 1000 G.M.T.

Height (*feet*).	*Wind Direction* (*Degrees from North*).	*Wind Speed* (*m.p.h.*).
500	220	15
1,500	240	17
3,000	250	20
5,000	240	25
7,000	240	27
10,000	230	30

NOTE.—I. If any figures are missing a hyphen or dash is transmitted in place of each missing figure.

II. When the information regarding the direction and speed of low cloud at an *inland* station is not available at 0700, 1000, 1300 or 1600, the corresponding group is omitted from the message.

III. The specifications of the codes used are given in the pages following.

Time of Observation	Place.	General Weather.	Visibility.	CLOUD. Height of Lowest Cloud (feet).	CLOUD. Amount 0 = Nil; 10 = Overcast. Amount of Low Cloud.	CLOUD. Amount 0 = Nil; 10 = Overcast. Total Amount of Cloud	Wind at Surface (Speed in m.p.h.)	Weather in Preceding Two Hours.
1100	Croydon -	Cloud increasing	4,000 yds.	1,500	4	9	S. by W.5	Cloudy.
1100	Biggin Hill	Cloud, slight mist	4 miles	800	8	10	S.W.5 -	Mist.
1100	Lympne -	Fog - - -	200 yds.	Below 150	10	10	S.S.W.2 -	Thick fog.
1100	BeachyHd	Mist - -	2,000 yds.	450	10	10	S.W.10 -	Thick fog.
1100	Channel visibility from Hythe - -		4,000 yds.	--	--	--	—	—
1100	,,	Beachy Head	2,000 yds.	--	—	—	--	-
1100	,,	Dungeness -	4,000 yds.	—	—	--	—	—

Forecast : Clouds below 500 feet inland. Slight rain probable. Cloud lifting and visibility improving on coast with freshening S.W. winds.

CODE 1.

Approximate Speed of Low Cloud (F).

Code No.	Corresponding Mean Speed.		Limits of Speed.	
	Km. per hour.	Miles per hour.	Km. per hour.	Miles per hour.
0	Less than 5	Less than 3	0 to 7	0 to 4
1	15	9	8 ,, 22	5 ,, 14
2	30	19	23 ,, 37	15 ,, 23
3	45	28	38 ,, 52	24 ,, 32
4	60	38	53 ,, 67	33 ,, 42
5	75	47	68 ,, 82	43 ,, 51
6	90	56	83 ,, 97	52 ,, 61
7	105	66	98 ,, 112	62 ,, 70
8	120	75	113 ,, 127	71 ,, 79
9	135	85	128 ,, 142	80 ,, 89

CODE 2.

Form of Cloud (A.a.).

1 = Ci.
2 = Ci. St.
3 = Ci. Cu.
4 = A. Cu.
5 = A. St.
6 = St. Cu.
7 = Nb.
8 = Cu. (or Fr. Cu.).
9 = Cu. Nb.
0 = St.

In the case of stratus cloud of amount 10, when the corresponding figures in the cloud group would be 00, the figure for cloud height and the figures for present weather would prevent misunderstanding.

CODE 6.

Visibility (V or V_s).

Code No.	*Description.*
0 =	objects not visible at 50 metres (55 yards).
1 =	objects visible at 50 metres but not at 200 metres (220 yds.).
2 =	,, ,, 200 ,, ,, 500 ,, (550 ,,).
3 =	,, ,, 500 ,, ,, 1,000 ,, (1,100 ,,).
4 =	,, ,, 1,000 ,, ,, 2,000 ,, ($1\frac{1}{4}$ miles).
5 =	,, ,, 2,000 ,, ,, 4,000 ,, ($2\frac{1}{2}$,,).
6 =	,, ,, 4,000 ,, ,, 10,000 ,, ($6\frac{1}{4}$ miles).
7 =	,, ,, 10,000 ,, ,, 20,000 ,, ($12\frac{1}{2}$,,).
8 =	,, ,, 20,000 ,, ,, 50,000 ,, ($31\frac{1}{4}$,,).
9 =	,, ,, above 50,000 ,, ($31\frac{1}{4}$ miles).

CODE 7.

State of the Sea (S).

0 = no swell .... }
1 = moderate swell .... } Calm or slight sea.
2 = heavy swell .... }
3 = no swell .... }
4 = moderate swell .... } Moderate sea.
5 = heavy swell .... }
6 = rather rough sea.
7 = rough sea.
8 = very rough sea.
9 = mountainous sea.

General Forecasts.

Forecasts are issued daily by wireless as follows :—

General inferences based upon 7h. and 18h. observations are issued from the Air Ministry (GFA 1,400 m. C.W.) at 0915 and 2000. At 0930 and 2130 messages are issued from Poldhu (MPD 2,800 spark) giving a forecast of conditions over the western seaboard of the United Kingdom (plain language).

Gale Warnings.

Gale warnings are issued by W/T from the following stations on a wavelength of 600 m. whenever an atmospheric disturbance is approaching or developing which is likely to cause a gale (Beaufort Force 8) in the open sea within 150 miles of the issuing station :—

Malin Head	GMH	Seaforth	GLV
Valentia	GCK	Niton	GMI
Land's End	GLD	Wick	BYG
Fishguard	GRL	Cullercoats	GCC

Airship weather warnings are now issued by wireless telegraph direct from the Air Ministry instead of *via* the Admiralty.

GREECE

Meteorological and time signals are *proposed* as follows :—

(i) Communication of the weather bulletins issued by the Hydrographic Service.

(ii) Time signals according to observatory indications.

(iii) Navigational warnings to mariners and other important hydrographic matter requiring immediate transmission (dangers, etc), according to the Hydrographic Service indications.

Athens transmits a meteorological report at 0700 (G.M.T) on a wavelength of 1200 metres.

HAWAII

Weather bulletins obtained from the United States Weather Bureau at Honolulu are broadcasted daily by the Pearl Harbour Radio Station (NPM) at 8 a.m., noon, 4 p.m., and 8 p.m., and after time signal.

Time Signal.—U.S. Naval Radio Station, Pearl Harbour, T.H., transmits time signals daily on 600-metre damped, and 11,200-metre undamped, waves at noon, 180th meridian time—*i.e.*, at 2355-2400 (G.M.T.), accurate to within 0·2 second with San Francisco Naval Observatory time.

HOLLAND.

(*a*) Transmitting station—Scheveningen (call signal PCH). Wavelength, 1,800 m. spark. Times of sending, 1115 and 2315 G.M.T. (?)

The messages are preceded by the letters KNMI and consist of 7h. and 18h. observations respectively from—

Part I.—Helder, Flushing, Grisnez, La Hague (Code BBBDD FWTTu).

Part II.—Yarmouth, Tynemouth, Skudesnaes, Sylt (Code BBBDD FWTT).

When necessary, a storm signal is given (giving notice of shifting of storm) and also a notice to mariners preceded by letters NBAZ.

(*b*) Transmitting station—Soesterberg (call signal STB). Wavelength 1,680 m. C.W. (0905 and 1505 messages on 1,900 m. C.W.).

Times of sending	0745	(G.M.T.)	(observations at	0700	(G.M.T.))
,, ,, ,,	0905	,,			
,, ,, ,,	0945	,,	,, ,,	0900	,,
,, ,, ,,	1045	,,	,, ,,	1000	,,
,, ,, ,,	1145	,,	,, ,,	1100	,,
,, ,, ,,	1345	,,	,, ,,	1300	,,
,, ,, ,,	1505	,,			

Observations relate to the following stations :—

1 Helder, 2 Flushing, 3 De Bilt, 4 La Hague, 5 Schiphol, 6 Rotterdam.

NOTE.—For stations 1, 2, 3 and 4, the reports are sent in the new International Code for hourly reports, including barometer readings.

For station 4 no barometer reading is included.

For stations 5 and 6, the reports are sent in the new code for abbreviated reports recommended by the International Commission for Weather Telegraphy in September, 1921, *viz.:* wwVhL NDDFW.

The 0945 and 1145 reports contain information for Schiphol and Rotterdam only.

In the 0745 message, the result of a pilot balloon ascent at De Bilt is given in the New International Code, for heights up to 1,500 m. (velocities in km/hr.).

The 0905 and 1505 reports are " upper-air " reports and include upper-winds at De Bilt above 1500 m. and upper-air temperatures and humidities at Soesterberg. (Velocity in km/hr.; pressure in mm.).

The W/T station Soesterberg sends an aerological report* to Germany at 0915 and 1525 (Amsterdam time) combined with synoptic weather reports.

LONDON-AMSTERDAM AIR-ROUTE.
(Route weather Reports.)

Route weather reports for the Aerial route London-Amsterdam will be sent out by Soesterberg at 1005, 1105 and 1405 (Amsterdam time). These reports will be sent on a wavelength of 1,680 m. C.W. and will be issued in the International Code for route weather reports as used for route London-Paris, with an addition of a 5-figure group for direction and speed of the clouds.

Observations refer to Helder (1); Vlissingen (2); De Bilt (3); Scheveningen (4); (the number in brackets is the station number).

Code: Station number $DDFD_1F_1$ ALaNh $wwWVV_s$ BBBKc Cddvv.

NOTES.—The fourth group is missing for station (4).

At 1105 and 1405 Schiphol (5) and Rotterdam (6) will also send wwVhl NDDFW. At the end of the 0805 report a pilot balloon warning at De Bilt will be added in the code; pilot hddvv, where h = 1, 2, 3 or 4, and 1 = 200 m., 2 = 500 m., 3 = 1,000 m., and 4 = 1,500 m. At 1205, a report containing only Schiphol (5) and Rotterdam (6) will be issued (same as report at 1005).

At 1025 and 1625 a complete aerological report* will be issued, containing the results of the wind observation above 1,500 m., the temperatures and the amounts of humidity according to an observation by aeroplane at Soesterberg.

This report will be given in the International Code: Pilot hddvv (3 times) temp. p_1 p_1 T_1 T_1 H_1 p_2 p_2 T_2 T_2 H_2, etc. (9 times), where h = 1, 2 . . . . 9 (1 = 200 m., 2 = 500 m., 3 = 1,000 m., 4 = 1,500 m., 5 = 2,000 m., 6 = 3,000 m., 7 = 4,000 m., 8 = 5,000 m., 9 = 6,000 m.), while ppTTH gives the barometer, temperature and humidity, respectively at 200, 500, 1,000, 1,500, 2,000, 2,500, 3,000, 4,000, 5,000 m.

In the pilot balloon warnings the direction of the wind is given in ten degrees, the speed in km. per hour. In the groups after temp. pp means the barometer in mm. (first figure omitted) and TT means the temperature in whole degrees centigrade (50 added for temperatures less than 0).

The first four groups of " Temp. " are repeated in the route weather report of 1105, also those of " Pilot " when they have not yet been issued at 0805.

All times used are Amsterdam mean time.

* = " Upper-air " report.

HONG-KONG.

A summary of meteorological conditions and weather forecasts will be broadcasted (on a 600 metre wavelength from a 5 kw. spark set) by Cape d'Aguilar daily at 0500 (G.M.T.) and repeated at 0900 (G.M.T.) (1 p.m. and 5 p.m. Hong-Kong standard time).

Storm warnings are broadcasted at about 0400 (G.M.T.) and repeated every two hours until 1600 (G.M.T.). If a second warning is issued during the day the later warning will be substituted.

When within range of Cape d'Aguilar the captain will arrange for observations to be made at 0600 and 2200 (G.M.T.) and a message, prepared by the observer, will be handed to the operator for transmission containing the following information.:—

(*a*) Ship's name, position, and the time of observation (G.M.T.).

(*b*) Barometer reading (with no correction whatever, except in the case of ships which have not sent comparison observations to the observatory at Hong-Kong). Such ships should correct the readings of mercurial barometers for index error and reduce them to 32° F., sea level, and gravity at 45° latitude, using the best index-error available and adding the word "corrected."

(*c*) Thermometer reading (if the barometer is of the mercurial type).

(*d*) Wind direction and force.

(*e*) State of weather (in plain language).

Under no circumstances will the operator write these messages.

Reports for transmission from the ship will be addressed to "Royal Observatory, Hong-Kong," and immediately on the acceptance of these messages the operator will enter (*a*) Prefix "S," (*b*) Date, (*c*) Time handed in (G.M.T.).

All messages handed in under the above conditions shall be dealt with as follows :—

They shall be communicated to the coast station at the first opportunity, and shall receive priority as Government messages.

Wherever possible, each message shall be repeated.

All messages shall be treated free of coast tax, ship tax, and land charges.

Reports handed in for transmission written on any form other than on the message form numbered SI, shall be affixed to a message form SI in such a manner as not to cover the space reserved for service instructions and other data.

TIME SIGNALS.

The Hong-Kong Observatory also sends wireless Time Signals *via* Stonecutters at the even seconds between 0156 and 0200 (G.M.T)., and between 1256 and 1300 (G.M.T). The 2nd, 28th, 50th, 52nd and 54th seconds are omitted for the purpose of identifying the signals.

The Time signals are preceded by the following warning signals from Stonecutters between 0154 and 1155 (G.M.T). and between 1254 and 1255 (G.M.T.).

CQ DE BXY HK TIME WAIT

Both warning and time signals are sent out on a wavelength of 2,000 metres from a 30 kw spark set. The time signals are dots of about 0.2 second duration. Radiotelegraphic land and ship stations within range of Stonecutters are required to keep silent between 0154 and 0200 (G.M.T.) and between 1254 and 1300 (G.M.T.) in accordance with Article 45, paragraph 3 of the Service Regulations appended to the International Radiotelegraph Convention of 1912. Operators are also required to keep themselves provided with the most accurate time available in order to know when to shut down.

The Director of the Royal Observatory at Hong-Kong requests that every master possessing a W/T installation will send observations at the times stated and thus increase the accuracy and utility of the observatory forecasts.

HUNGARY.

Transmitting station—Csepel (near Budapest). Call signal, HB. Wavelength. 3,000 m. spark. Time of sending, 0920 (G.M.T.) (observations at 7h. local time).

The message begins with Metro Hongroise and observations relate to the following stations:—

01	Bupapest	19° 2′ E.	47° 30′ N.
02	Szombathely	16° 36′ E.	47° 16′ N.
03	Kaposvar	17° 48′ E.	46° 22′ N.
04	Szeged	20° 09′ E.	46° 15′ N.
05	Debreczen	21° 38′ E.	47° 31′ N.

Code: station number BBBDD FWTTC βbbRR MMmm.

At 1030 G.M.T. a weather bulletin is issued by the Institute of Meteorology and Magnetism, Budapest.

INDIA.

TIME SIGNALS.

Time Signals based on the International system are sent out from Calcutta Radio Station (VWC) twice daily, at 0127-0130 and 1327-1330 (G.M.T.). The wavelength used is 2,000 metres and the power 30 kw. The signals are controlled from the Alipore Observatory at Calcutta.

Should the time signals be inaccurate for any reason, they will be followed by the "erase" signal of nine or more dots and the words "Signal failed."

Arrangements are being made for similar signals to be sent out at 0057–0100 and 1257–1300 (G.M.T.) from Bombay Radio Station (VWB). These signals will be controlled from Colaba Observatory, Bombay.

WEATHER REPORTS.

The Meteorological Department supplies each day to the radio stations concerned, messages to be signalled broadcast at the following times and on the specified wavelengths:—

Station.	*Call-sign.*	*Wavelength metres.*	*Time (G.M.T.).*
Bombay	VWB	2,000	0100 and 1300
Madras	VWM	2,000	
Rangoon	VTR	1,200	
Karachi	VWK	2,000	0130 and 1330
Calcutta	VWC	2,000	
Port Blair	VTP	1,200	

Arrangements have been made under which certain large ships when in the Arabian Sea or the Bay of Bengal send daily weather messages to the Indian Meteorological Department. These messages contain information of the ship's position, barometer reading, wind force and direction, state of sea and cloud.

Copies of the Code used for these telegrams have been distributed to several shipping agents in India, and are also obtainable from the Indian Meteorological Department.

The report sent out from Bombay and Karachi gives the weather conditions in the East Arabian Sea, while that broadcasted from the other four stations refers to the Bay of Bengal.

ITALY

AEROLOGICAL AND METEOROLOGICAL SERVICE.

I. At present the service is carried out by three groups of stations, the central station of the first group being at Rome, that of the second group at Florence, and that of the third at Naples.

II. Transmissions are made twice a day at the hours given in the table below, in which the length of wave used is also given :—

Groups.	*Stations.*	*Times.*		*Wave-lengths.*
I. Central Station,				
Rome ..	**Genoa†** ..	0730 to 0735	1330 to 1335	600 s.
	Leghorn ..	0735 ,, 0740	1335 ,, 1340	1,200
	Ancona ..	0755 ,, 0800	1355 ,, 1400	1,200
II. Central Station,				
Florence ..	**Padua** ..	0740 ,, 0745	1340 ,, 1345	900
	Turin ..	0745 ,, 0750	1345 ,, 1350	900
	Milan ..	0750 ,, 0755	1350 ,, 1355	900
III. Central Station,				
Naples ..	**Vittoria†** ..	0725 ,, 0730	1325 ,, 1330	600
	Maddalena ..	0730 ,, 0735	1330 ,, 1335	600
	Messina ..	0735 ,, 0740	1335 ,, 1340	600
	Brindisi ..	0740 ,, 0745	1340 ,, 1345	2,500 arc.

III. The Florence and Naples stations transmit a summary of the reports received to Rome (ICD) at the following times, and with the following wavelengths :—

Stations.	*Times.*		*Wavelength.*
Naples	0800 to 0810	1400 to 1410	3,200 arc.
Florence	0810 ,, 0820	1410 ,, 1420	900 s.

IV. The complete reports are then transmitted from Rome (IDO) at 0930 (observations at 7h.) and 2045 (observations at 18h.) with wavelength 11,000 m. C.W. At 0345 Rome (IDO) transmits a local weather report to Paris.

The same synoptic report is issued simultaneously from Centocelie (call signal ICD) with wavelength 2,250 m. spark.

V. Observations relate to the following stations marked thus (*). The other stations will commence operations as soon as ready :—

* 01	Turin.	* 08	Leghorn.	15	Cagliari.
* 02	Milan.	* 09	Ancona.	* 16	Messina.
03	Trent.	10	Chiete.	17	Palermo.
* 04	Padua.	* 11	Rome.	* 18	Vittoria.
05	Trieste.	* 12	Maddalena.	* 19	Taranto.
* 06	Genoa.	* 13	Naples.	* 20	Venice.
* 07	Florence.	* 14	Brindisi.		

† Genoa passes the reports to Leghorn and Vittoria to Messina for transmission to Centocelie.

VI. Codes used :—

A.—Observations at 7h.

There are four groups of five figures each, giving observations at 7h., followed by two groups of six figures giving upper air data.

Code.—Station number (two figures) BBBDD FWTTC βbbRR MMmmu $V_1D_1V_2D_2V_3D_3$ $V_4D_4V_5D_5V_6D_6$

Where first four groups are in the old International Code and $V_1D_1V_2D_2$, etc., give velocity and direction of the wind in m/s at altitudes of 500, 1,000, 1,500, 2,000, 3,000 and 4,000 m. above sea-level.

D = direction.

0 = no wind.		5 = wind from	S.
1 = wind from	N.	6 = ,,	S.W.
2 = ,,	N.E.	7 = ,,	W.
3 = ,,	E.	8 = ,,	N.W.
4 = ,,	S.E.		

V = velocity.

0 from 0 to 1 m/s.	5 from 9 to 11 m/s.
1 ,, 1 ,, 3 ,,	6 ,, 11 ,, 13 ,,
2 ,, 3 ,, 5 ,,	7 ,, 13 ,, 15 ,,
3 ,, 5 ,, 7 ,,	8 ,, 15 ,, 17 ,,
4 ,, 7 ,, 9 ,,	9 above 17.

B—Observations at 18h.

Code: Station number (two figures). BBBDD FWTTC $V_1D_1V_2D_2V_3D_3$ $V_4D_4V_5D_5V_6D_6$ (where groups have same meaning as at 7h.).

Notes.—Should any data be missing from a group, an equal number of x's are inserted in its place. Should soundings not be taken, the message concerning one station will consist of only two groups (meteorological); and when the sounding does not reach 2,000 m. the message will consist of three groups (two meteorological and one aerological).

The "Saseno" IDB wireless telegraph station transmits aerological and meteorological reports at 0700 and 1700 to the ship at Brindisi IDV, with a 600 s. wave.

The wireless telegraph station at St. Elmo (Naples) also carries out the following special service for the exchange of reports on local weather conditions, and on the departure and arrival of aircraft for the Rome to Naples and Naples to Rome service.

St. Elmo W/T station, wave 3,200 c.	0700 to 0745	Exchange of meteorological information and reports of movements of aircraft.
Centocelie ,, ,, 3,850 c.		
St. Elmo ,, .. at	0915, 1100	Bulletin.

JAPAN

The storm warnings issued by the Central Meteorological Observatory at Tokyo are transmitted free of charge to vessels at sea from the wireless telegraph stations at Choshi, Fukkikaku and Dairenwan, according to the following method (it always being understood that this shall not apply in the case of special transmissions made at the request of vessels):

The storm warnings will be issued in the English language, and will comprise the items referred to in (*a*) and (*b*) below:

(*a*) Text of warning, date, time; position, rate and direction of movement of centre of atmospheric depression or typhoon.*

(*b*) Maritime instructions and notices. When storm warnings are received at the coastal stations, they will be immediately transmitted, and

* A typhoon is an extremely violent storm, travelling slowly, and from 50 to 100 miles in diameter.

will be repeated from the Choshi station at 9.5 p.m., from the Fukkikaku station at 8.30 p.m., and from the Dairenwan station at 9 p.m.

Wavelengths of 600 metres are employed, and the storm warnings are continued three times after the signal "QST" has been thrice repeated.

NOTIFICATION OF THE DEPARTMENT OF COMMUNICATIONS NO. 1,105.

From December 11th, 1916, the following procedure for announcing central standard time at 1200-1204 (G.M.T.) by wireless telegraphy was adopted at the Choshi and Funabashi wireless telegraph stations :—

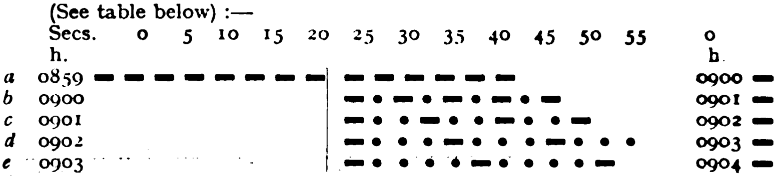
Procedure for Time Signalling by Wireless Telegraphy.

1. Every evening, with the exception of Sundays, Time Signals are automatically made by the transmitting apparatus at the Choshi and Funabashi wireless telegraph stations, as communicated by the Tokyo Observatory through the connected telegraph wires on land. The wavelength of 600 metres is used in the case of the Choshi station and that of 4,000 metres in the case of the Funabashi station.

The time to be signalled in accordance with the above is indicated five times—*viz.*, at 9.0 p.m. (Central Japan Standard Time), 9.01, 9.02, 9.03, and 9.04 (1200-1204 G.M.T.) by means of dashes continuing for one second from the times mentioned, and following the various warning signals distinguished as below :—

(*a*) The first warning signal, consisting of dashes, will commence at 8.59 p.m., and continue till 8.59.55, after which a suspension of five seconds will be followed by a dash, continuing for one second.

(See table below) :—



(*b*) The second warning signal, consisting of a long dash and a dot, will commence at 0900.30 and continue till 0900.55, after which a suspension of five seconds will be followed by a dash continuing for one second.

(*c*) The third warning signal, consisting of a dash and two dots, will commence at 0901.30 and continue till 0901.55, after which a suspension of five seconds will be followed by a dash, continuing for one second.

(*d*) The fourth warning signal, consisting of a dash and three dots, will commence at 0902.30, and continue till 0902.55, after which a suspension of five seconds will be followed by a dash, continuing for one second.

(*e*) The fifth warning signal, consisting of a dash and four dots, will commence at 0903.30, and continue till 0903.55, after which a suspension of five seconds will be followed by a dash, continuing for one second.

MALTA

A meteorological message is issued daily at 0900 and 2100 (G.M.T.) by Rinella (BYZ) Wireless Telegraph Station ; wavelength 4,200 C.W.

MAURITIUS

Time Signals are radiated daily by the Mauritius Wireless Station at 9 a.m. and p.m. (G.M.T.) to 9.1 a.m. and p.m. on a wavelength of 2,000 metres spark, but the times are stated to be not perfectly accurate. The procedure adopted is :—N's made by hand every ten seconds, commencing at 0859 and concluding with a dash at 0900. G's made by hand every ten seconds, commencing at ten seconds past 0900, concluding with a dash operated

from Observatory at 0901. During the past year wireless information concerning cyclonic disturbances have been issued to ships within range as cyclones occurred.

MEXICO

A service of hourly signals has been established, and these are transmitted in the following manner :—Every day at 1155 (Tacubaya D.F. time, 6h. 36m. 46.67secs. behind Greenwich) the wireless station at Chapultepec, with a transmitter of 20 kw. and a wavelength of 2,000 metres, gives the general call; at 1156 it gives the call of its own station (XDA); at 1157 it makes a telegraphic dot every second until 1157.29 seconds; a silence of a second and more dots until 1157.55 seconds; a silence of 5 seconds; it then again makes dots from 1158 to 1158.29 seconds and from 1158.31 seconds to 1158.55 seconds; dots from 1159 to 1159.29 seconds and from 1159.31 seconds to 1159.50 seconds; a silence of 10 seconds and at 1200, exactly, a dash lasting a second.

At 1816.13 seconds (Tacabuya time) the same wireless station of Chapultepec with its 200 kw. transmitter and a wavelength of 5,500 metres, gives the general call; at 1817.13 seconds it gives the call of its own station (XDA); at 1818.13 seconds it makes telegraphic dots every second until 1819.8 seconds, then a silence of 5 seconds and it begins to make telegraphic dots again at 1819.13 seconds, and thus successively until 1823.8 seconds, when, after a silence of 5 seconds, it gives a dash lasting one second 1823.13 seconds, which coincides with 0100 Greenwich time.

The coastal wireless stations of Campeche, Guaymas, Mazatlan de Sinaloa, Payo Obispo and Vera Cruz send out weather reports daily at 9 a.m. (? local time), each word being repeated twice. If a dangerous change for shipping appears likely advice is sent out in the same form at any hour of the day or night.

A service of "Shipping Advice" has also been established, and this is transmitted by the same coast stations whenever it seems advisable at 12 noon (? local time), and for three consecutive days in cases of change of lighthouse lights, subsidence of the coasts and any dangers which concern navigation.

MOROCCO.

For the purpose of publishing meteorological and aviation intelligence it has now been arranged that certain stations, civil and military and naval, transmit at certain definite times, three times per diem, meteorological information for the use of aviation and scientific purposes.

The transmitting posts and hours are as follows :—

Tangier transmits at	0700	1300	1800
Casablanca transmits at	0705	1305	1805
Mequiney transmits at....	0710	1310	1810
Middelt (Assaka) transmits at....	0720	1320	1820
Bow Denie transmits at.... ...	0730	1330	1830
Agadir transmits at	0745	1345	1845

These readings are picked up by the following posts and transmitted to their respective sub-divisional aviation centres :—

Rabat (Control), Marrakesh (Morocco), Tadla, Fez and Taza.

Rabat (Control) also passes the information to the Headquarters of the Service Météorologique du Maroc, which is at present established at the aviation ground at Rabat.

As all commercial aeroplanes (at present only Latécoère Line) land at the aviation ground at Rabat from Toulouse, Barcelona, Alicante, Malaga, they are in possession there of the last meteorological readings for the whole of the French Morocco.

For the transmission of the meteorological and aviation news from Morocco to the world generally, the post of Sidi Abdallah, Tunis, takes in the readings of the wireless posts above mentioned, with those for the rest of Northern Africa, and transmits them in due course.

For the protection of aerial lines of flight, planes flying early in the day during the summer months, the following posts in French Morocco transmit their information meteorological news at an earlier hour than as above stated, April 1st to October 1st.

Meknes (Mequiney)	at 0530.
Casablanca	at 0535.
Middelt (Assaka)	at 0540.
Tangier	at 0545.
Bow Denib	at 0550.

Transmitting station: Mediouna (call signal: CNM).
Wavelength: 5,000 m. C.W.

Times of sending	0845	(G.M.T.)	(observations at 0700 G.M.T.).
,, ,,	1430	(G.M.T.)	(observations at 1300 G.M.T.).
,, ,,	1945	(G.M.T.)	(observations at 1800 G.M.T.).

The messages begin with the words "Meteo Rabat" and contain observations relating to the following stations:—

01 Tangier.	09 Mequinez.
03 Rabat.	12 Taza.
04 Casablanca.	15 Bu-denib.
07 Agadir.	

08·45 *Message.*

Code: Station number (two figures) BBBDD FWTT βbbu. The message may also contain upper winds at three stations in the same code as those included in the Eiffel Tower reports (page 1150).

14·30 *and* 19·45 *Messages.*

Code: Station number (two figures) BBBDD FWTT βbb.

NETHERLANDS

Since July 1st, 1915, the station of Scheveningen Harbour has been sending at 11.15 and 23.15 (Greenwich time) on a wavelength of 1,800 metres a meteorological radiotelegram in Dutch and English, followed by a storm signal whenever necessary and also a notice to mariners in Dutch and English.

The meteorological radiotelegram is preceded by the letters KNMI, and consists of four sets of two groups of five figures each for the stations Helder, Flushing, Gris Nez, and The Hague; and, further, of four sets of two groups wherein one group has five and the other group four figures each for the stations Yarmouth, Shields, Skudnaes and Sylt, according to the scheme.

BBBDD FWTT(S).

The letter x is used to denote missing figures.

Following the above comes, if deemed important, first, the storm signal—*e.g.*, warning signal, signal of shifting south-east storm; second, the notice to mariners, preceded by the letters NBAZ—*e.g.*, wreck, mouth Hock of Holland.

Examples of meteorological radiotelegrams from the first and the fifth of the eight sets of two groups KMNI are 69010-21541 and 57316-4405; their translations follow:—

HELDER.	YARMOUTH.
Barometer, 769·0 mm.	Barometer, 757·3 mm.
Wind direction, E.S.E.	Wind direction, south.
Wind force, very light.	Wind force, moderate.
Sky, slightly cloudy.	Sky, overcast.
Temperature, 4° C.	Temperature, 5° C.
Sea, very smooth.	

Meteorological reports are also issued from Soesterberg at 0820, 1020 and 1420 (G.M.T.) since May, 1920, giving information for Helder (01), Flushing (02) and De Bilt (03) in the code BBBDD FWTTV.

NEW ZEALAND

(See Australasia.)

NORWAY

The meteorological wireless station at Quade Hook, is owned by the Norwegian Meteorological Institute. Storm warnings are sent from most of the wireless stations.

Transmitting station: Christiania Radio (call signal LCH).
Wavelength: 8,000m. C.W., position 59° 59′ N; 10° 41′ E.
Normal range: 1,100 km.

Times of sending: 0845 (G.M.T.) (observations at 7h. G.M.T.).
,, ,, 1550 (G.M.T.) (observations at 13h. G.M.T.).
,, ,, 2010 (G.M.T.) (observations at 18h. G.M.T.).

Observations relate to the following stations:—

Station No.	Station.	Position.	
		Latitude.	Longitude.
05	Green Harbour (S)....	78° 2′	14° 14′
10	Ingoy (S)	71° 4′	24° 9′
12	Tromso (S)	69° 39′	18° 58′
20	Aalesund (S)	62° 28′	6° 10′
22	Valdersund (S)	63° 52′	9° 45′
30	Okso (S)	58° 4′	8° 4′
32	Lister (S)	58° 6′	6° 34′
35	Bjornoya (S)	74° 28′	19° 17′
40	Andenes (S)....	69° 20′	16° 8′
42	Rost (S)	67° 30′	12° 4′
50	Bergen (S)	60° 24′	5° 19′
53	Faerder (S)	59° 2′	10° 32′
60	Vardo (S)	70° 22′	31° 8′
70	Bronnoy (S)....	65° 28′	12° 13′
80	Utsire (S)	59° 18′	4° 53′
82	Skudenes (S)	59° 9′	5° 16′
90	Dombaas	62° 5′	9° 7′
91	Trondhjem	63° 26′	10° 25′
97	Bergen	60° 24′	5° 19′
98	Tromso	69° 39′	18° 58′
99	AAs	59° 40′	10° 46′

Observations are given in the code recommended by the Commission for Weather Telegraphy, London, November, 1920.

Observations for coastal stations (marked " S ") are sent in the following code :—

At 7h. and 18h. BBBDD FwwTT cbWVH ALaNh RRSV r
At 13h. BBBDD FwwTT cbWVH ALaNh

For stations 12 (Tromso) and 50 (Bergen) an additional cloud group in the form C_1ddVV is given, when possible.

Observations for 90 (Dombaas Land Station) are given in the code :—

7h. BBBDD FwwTT cbWVH ALaNh RRmmr C_1ddVV
13h. ,, ,, ,, ,, C_1ddVV
18h. ,, ,, ,, ,, RR – – r C_1ddVV

For station 91 (Trondhjem) a nephoscope* group only is sent in the form C_1ddVV.

At the end of the 7h. and 18h. messages are given the results of pilot balloon ascents in the code $h_1$ddvv for (VV = Km–hour).

97 Bergen 99 AAs
98 Tromso

Observations for the following stations are sent only when data from other stations are not available at the time of issue :—

12 Tromso 32 Lister 82 Skudesnaes
22 Valdesund 42 Rost

NOTE.—Barometer readings are given in millibars, and barometric tendency in half millibars.

PANAMA

(See United States.)

PERU.

It is proposed to initiate a time signal service at Lima Station as soon as circumstances permit, but no arrangements have as yet been made for the transmission of weather, meteorological or hydrographic signals.

PHILIPPINE ISLANDS

Time Signals are transmitted from Manilla to every Telegraph Station all over the country by land lines every day at 1100 a.m. (0300 G.M.T.). The clock of the Central Observatory, which is connected with the Bureau of Posts telegraph office at Manilla by a land line, is connected to the telegraph circuit at 10.55 a.m. Time signals are then sounded. In the last half minute before 11.00 a.m. the operator at the central office dots with the key during 20 seconds to indicate that it is the last half minute. Ten seconds are omitted in order to give a chance to adjust instruments to receive the final corrected time. Then, at the expiration of the 10 seconds, a long heavy dash is given, thus completing the time and correcting the clocks in all offices. The Cavite Naval Radio Station co-operating with the Bureau of Posts and the Manilla Observatory sends time signals of the 120th meridian East of Greenwich, at 1100 and 2200 every day, Sundays and holidays inclusive. Manilla Observatory time signals begin at 1055 and 2155, standard time of the 120th meridian East of Greenwich, and continue for five minutes. During this interval every tick of the clock is transmitted except the 28th, 29th, 54th, 55th, 56th, 57th, 58th and 59th of each minute. Thus far the radio transmission has been by a 5 kw. spark set on a wavelength of 952 metres; the time signals are broadcasted now on both arc and spark transmitter simultaneously, using 952 metres on the spark and 5,000 metres on the arc

* A nephoscope is an instrument for accurately measuring the motions of clouds.

transmitter. Weather warnings are sent immediately following the time signal, and are of the same wavelength as the time.

The Naval radio station is connected with Manilla by land line.

Weather reports are exchanged regularly between the observatory at Manilla and that of Guam, *via* the Naval radio station at Cavite. Weather warnings are also sent to Hanoi, French Indo-China, *via* Cavite.

In the near future weather warnings will also be broadcasted from the station at Batangas.

POLAND

Transmitting Station: Warsaw (call signal: WAR).
Wavelength: 2,000 m. spark.

Times of sending: 0755 G.M.T. (observations at 7h. local mean time).
,, ,, 1530 G.M.T. (observations at 13h. local mean time).
,, ,, 2020 G.M.T. (observations at 19h. local mean time).
Each message begins with the words "Meteo Pologne."

The message is composed of two parts; the first part contains ordinary observations, the second wind-sounding.
Observations relate to the following stations:—
01 Posen, 02 Warsaw, 03 Bialystok, 04 Lodz, 05 Lublin, 06 Cracow, 08 Lemberg, 10 Bremberg, 11 Zakepane.

Observations at 7h.

Part i (ordinary observations).
Code: Station number (two figures) BBBDD FWTTC βbbRR MMmm.
Part ii (wind-soundings).
Code: Station number (two figures) $D_1D_1V_1V_1D_2$ $D_2V_2V_2D_3D_3$, etc. (as Eiffel Tower code, which *q.v.*).

Observations at 13h. and 19h.

Part i (ordinary observations).
Code: Station number (two figures) BBBDD FWTT βbb.
Part ii (wind-soundings) 13*h. report only*, in code as for 7h. observations.

PORTUGAL.

Transmitting Station: Lisbon PQL.
Wavelength: 1000 m.
Times of sending weather messages: 0800, 2000 G.M.T.

PORTUGUESE EAST AFRICA

Time signals are sent out twice daily from Lourenço Marques at 7.57 to 8 a.m., and 6.57 to 7 p.m. (G.M.T.), on a wavelength of 600 metres following the system of the Eiffel Tower Ordinary 10 a.m. Time Signal, *q.v.*

Following every time signal, a local weather report is transmitted in English as follows:—

> CRZ Weather Report—at 8 a.m. G.M.T. (or 7 p.m. G.M.T.). Pressure at sea level 760.5 millimetres, wind E.N.E. strong, sea rough. Campos Rodrigues Observatory, Lourenço Marques.

PUERTO RICO

The San Juan Station is used for collecting meteorological data from the adjacent American Islands of the West Indies and from Cuba, and this information is, in turn, transmitted to the United States *via* the high power station at El Cayey, Puerto Rico.

ROUMANIA

Transmitting station: Heresbau (call signal: BUC).
Wavelength: 7,500 m. arc.

Times of sending 0400 (G.M.T.) (observations at 1800 and 0100 (G.M.T.).
„ „ 0750 (G.M.T.) (observations at 0700 G.M.T.).
„ „ 1350 (G.M.T.) (observations at 1300 G.M.T.).
The observations refer to Bucharest.
Code: Similar to British

SAMOA

Local weather bulletins, preceded by the letter T are broadcasted by the Tutuila Naval Radio Station (NPU) at 8 a.m., noon, 4 p.m., and 8 p.m.

SANTO DOMINGO

(Dominican Republic, West Indies.)

The aviation service (U.S.M.C.), situated a few miles from Santo Domingo, makes observations twice a day on the state of the weather, one in the morning and one in the evening. These observations are immediately reported by telephone to the Radio telegraphic station at Santo Domingo, which transmits them to the Observatory in Washington (*via* San Juan, Puerto Rico), as urgent messages.

Warnings of storms and hurricanes are circulated as soon as they are received, and uniformly every four hours afterwards, except at 0400. These warnings are also telephoned to the Signal Tower, " Fuerte Ozama," where these signals are sent out. This Signal Tower dominates the whole bay south of Santo Domingo.

During the summer months, especially between 1900 and 0500, a strong statical action is experienced. During the winter months, from the latter part of September until May, very good conditions prevail, and stations which are not able to hear during the summer months can hear very clearly then.

SERBIA.

Transmitting station: Belgrade (call signal: HFB).
Wavelength: 4599 m. damped.
Times of sending 0740 (G.M.T.) (observations at 18h. and 7h. local time).
„ „ 1445 (G.M.T.) (observations at 14h. local time).

Messages commence with the words " Meteor Belgrade."
Code: Old International Code.

SOUTH AFRICA

The present arrangements for meteorological reports are as follows:—

	Station.	Times G.M.T.	
VNC	Capetown (Slangkop)	1315	Daily (except Sundays) a CQ message forecasting weather conditions along the coast.
	Port Elizabeth	1330	
VND	Durban	1300	

Durban also sends out daily (except Sundays) at 1330, a message stating the *local* weather conditions and barometer and thermometer readings taken at 0800.

The arrangements made in the Union of South Africa for the transmission of radio time signals for the use of shipping in South African waters is as follows:—

A special clock at the Royal Observatory, Capetown, is adapted to give automatically a series of signals of a distinctive character extending over an interval of half a minute. The clock is brought into conformity daily with

the observatory standards shortly before the hour selected for transmitting the signals. The hour chosen is 11 p.m., Union standard time (9 p.m. G.M.T.).

The time signal is preceded by the usual warning signal from the Slangkop Radio Station. The time signal proper consists of twelve dashes, each of about ¾ of a second in duration, in five groups, commencing at the following Greenwich mean times :—

Group I.			*Group II.*			*Group III.*			*Group IV.*			*Group V.*		
h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
8	59	30	8	59	38	8	59	44	8	59	48	8	59	54
—	—	32	—	—	40	—	—	—	—	—	50	—	—	56
—	—	34	—	—	—	—	—	—	—	—	—	—	—	58
												9	0	0

The beginning of the last dash corresponding exactly with 9 p.m. Greenwich or 11 p.m. South African standard time.

SPAIN

The military radiotelegraph station of Carabanchel will transmit from March 1st, 1920, three radiotelegrams at the hours of 1000, 1530 and 2030 (G.M.T.) (observations at 7h, 13h. and 18h. respectively).

Wavelength, 2,000 metres.
Power, maximum.

All the radiotelegrams will commence with the initials of the Carabanchel wireless station, EGC, followed by SME, the initials of the words, "Servicio Meteorológico Espanol."

Radiotelegram at 1000 h.

This will contain the results of the meteorological observations at the stations given below, preceding the groups of signs corresponding to each one of the initials of the name of such station as indicated hereunder :—

1. MD, Madrid; 2, LC, La Coruña; 3, SF, San Fernando; 4, BA, Barcelona; 5, SA, Santander; 6, VD, Valladolid; 7, ZA, Zaragoza; 8, MA, Mahón; 9, BD, Badajoz; 10, CD, Córdoba; 11, AI, Alicante; 12, AL, Almeria; 13, ME, Melilla; 14, TE, Tetuán; 15, IZ, Izaña (Teneriffe). The observations of the stations 1–3 inclusive will be made at 7h. The others will be at 8h. (G.M.T.).

For each station the results of the observation made close to the ground are expressed by means of the four groups recommended by the Paris Conference * :—

BBBDD. FwwTT. βbbRR. 4. { NNN¹N¹u (coast station). NNN¹N¹h (interior station).

See the instructions for the telegraph service published by the Central Meteorological Observatory.

If the station makes upper-air soundings, the four groups mentioned above are followed by the five :—

$D_1D_1V_1V_1$ $D_2D_2V_2V_2$ $D_3D_3V_3V_3$ $D_4D_4V_4V_4$

The first group indicates the direction and velocity of the wind in metres per second according to the atmospheric conditions 250 metres above the meteorological station, the second group at 500, the third at 1,000, the fourth at 2,000, and the fifth at 3,000.

*ww = present weather; w'w' = past weather.
NN = form and direction of motion of low cloud.
N'N' = form and direction of motion of high cloud.

RADIOTELEGRAM AT 1530 H.

This will contain the observations made at 13h. (G.M.T.) at the same stations mentioned for the previous radiotelegram, and drawn up in the same manner.

Next appears a group of nine figures which express the state of the sea on our coasts, in conformity with the following rule: the first sign from the left indicates the state of the sea on that part of the coast comprised between San Sebastián and Santander; the second between Santander and Cape Estaca de Vares; the third between Cape Estaca de Vares and the Portuguese frontier; the fourth between Huelva and Gibraltar; the fifth between Gibraltar and Almería; the sixth between Almería and Valencia; the seventh between Valencia and the French frontier; the eighth in the Balearic Isles; and the ninth in Argelia.

This is followed by a group of eleven figures, indicating the probable weather for the following twenty-four hours: the first sign from the left indicates the probable weather in the regions of Galicia, Asturias and León, giving preference to that concerning the coast; the second corresponds to the provinces of Santander, Vizcaya and Guipúzcoa, likewise giving preference to the phenomena most interesting to navigators; the third, the weather which will be experienced in the central part of Spain, the provinces of Burgos, Palencia, Navarra, Logroño, Valladolid, Soria, Zaragoza, Zamora, Segovia, Guadalajara, Salamanca, Avila, Madrid, Teruel, Cáceres, Toledo, Cuenca, Badajoz, Ciudad Real, and Albacete, giving preference to the kinds of weather interesting to agriculturists; the fourth, the probable weather in the north-eastern part of Spain, provinces of Huesca, Lérida, Gerona, Barcelona and Tarragona, in its part which most interests farmers and navigators; the fifth, the weather in Levante: provinces of Castellón, Valencia, Alicante, and Murcia, in the part which interests farmers and navigators; the sixth, the weather in Andalusia: provinces of Córdoba, Sevilla, Huelva, Cádiz, Málaga, Jaén, Granada and Almería, giving preference to the weather interesting agriculturists; the seventh, the weather in the Straits of Gibraltar and north part of Morocco, giving preference to weather interesting navigation; the eighth, the weather in the Balearic Isles and in the adjacent zone in the Mediterranean, giving preference to weather interesting navigation; the ninth, in the English Channel and Northern Cantábrico; the tenth corresponds to the part of the Atlantic near to Portugal; and the eleventh to the Canaries. Naturally, the limits of these zones cannot be perfectly defined, and it therefore remains for those who may make use of these services to discriminate, according to circumstances, whether the prognostication of one or other of the immediate regions is to be taken into account.

When, owing to lack of telegrams or other circumstances, the weather cannot be predicted as regards a specific district, the letter X will be substituted for the corresponding sign.

When it is required to signal the position of a cyclonic centre or line of squall (Grain) dangerous to navigation or aviation, the word " precaución " will be transmitted, and afterwards groups of six figures, which, if they refer to cyclonic centres, will commence with CI, and be followed by the group llLLBB, in which the first two, ll, will indicate the latitude of the centre expressed in complete degrees; the third and fourth, LL, the geographical longitude also of the said centre to the east or to the west of the Meridian of Greenwich, expressed in complete degrees, those of the west, 01, 02, 03, etc., and those of the east by 51, 52, 53, etc.; the fifth and sixth signs, BB, will give the number representing the atmospheric pressure in millibars, omitting the hundreds. If it is a line of squall, it will be given in groups of eight signs, preceded by GR, and followed by IILLBBDD, the first four, IILL, indicating the position of the point of the line at which the barometer is the lowest; the fifth and sixth, the atmospheric pressure at this point in millibars, and without hundreds; and the last two, DD, the direction of the line of squall at 1300 G.M.T.

When a regular service of storm signals is established at ports, there will be indicated by a group of ten figures those signals which it is necessary to establish at different parts of our coasts. The successive signs will correspond to the parts of the coast as indicated below: 1, Cantabrian Coasts from Cape Higuer to Cape Mayor; 2, from Cape Mayor to Cape Estaca de Vares; 3, Galician Coast from Cape Estaca de Vares to the Portuguese frontier; 4, from Cape Creus to Cape San Antonio; 5, Balearic Islands; 6, from Cape San Antonio to Cape Gata; 7, Cape Gata to the Straits of Gibraltar; 8, Straits of Gibraltar to the Portuguese frontier; 9, East Coast of Africa (Tánger-Arcila); 10, Canaries.

RADIOTELEGRAM OF 2030 H.

Code: BBBDD FwwTT βbbRR NNN¹N¹u (or NNN¹N¹h).

GENERAL REMARKS APPERTAINING TO RADIOTELEGRAMS.

When the results of a meteorological station do not arrive at Carabanchel in time for transmission, the initial of the name of such station will be placed at the corresponding place in the radiotelegram with the words "no llegó" (not arrived).

In all messages, missing figures and groups are indicated by x's, and if complete sets of observations are missing the station letter is followed by "falta."

Regarding stations shown in the radiotelegrams which are situated on the coast, only particulars of the state of the sea can be given with precision for San Fernando, La Coruna and Mahón; therefore for the others the fifth figure of its fourth group will express the state of visibility of the horizon.

METEOROLOGICAL RADIO-TELEGRAMS FROM THE SEA.

Spain has adopted the code for the wording of meteorological radiograms *from the sea* in accordance with the agreements of the International Commission of Meteorological Telegraphy held in London, November, 1920.

The following resumé of the code is given:—

Two types of ciphers have been adopted for the wording of meteorological radiograms for transmission from navigating boats, the *first* for boats not able to devote much attention to this work, not having the necessary available material or staff for making the observations, and the *second* for those able to give more attention to the work with a corresponding staff and material available.

These two types of groups are represented by the following symbols:—

First type: $QLLLx_1$ $llllx_2$ $BBDDx_3$ $FVKdx_4$ $wwGGx_5$ y_1 y_2 y_3 y_4 z.

Second type: $QLLLx_1$ $llllx_2$ $BBDDx_3$ $FVKdx_4$ $wwGGx_5$ $TTttx_6$ $CNWrx_7$ y_1 y_2 y_3 y_4 z. Where QLl gives position of observing ship and BB, $DD_1F_1V_1$ have the usual significance according to the International code.

K = the state of the sea according to the following code:—

	STATE OF THE SEA.	Numbers telegraphed.
Slight swell to swell and	Without swell	0
	swell	1
	big swell	2
	extensive swell	3
	turbulent swell	4
Heavy sea and	Without swell	5
	swell	6
	big swell	7
	extensive swell	8
	turbulent swell	9

d = the direction from which the waves of the swell come will be

expressed according to the following code :—

Numbers telegraphed.	Direction from which the swell comes.
0	There is no swell.
1	The swell comes from the N.E.
2	,, ,, E.
3	,, ,, S.E.
4	,, ,, S.
5	,, ,, S.W.
6	,, ,, W.
7	,, ,, N.W.
8	,, ,, N.

ww = weather at time of observation.
GG = time of observation in relation to the Greenwich meridian.
TT = temperature of air in complete degrees.
tt = temperature of sea-surface.
C = form of clouds.
N = total amount of clouds.
r = time that rain began to fall.
W = past weather.

CONFIRMATION CIPHERS.

As boats telegraph on many occasions a long way from any land station, there is no means of finding mistakes that may occur in the wording of radiograms or in their transmission by comparison with the results of another station near, as happens with land stations ; for this reason it was agreed in London to introduce into the wording of groups, confirmatory ciphers x_1 x_2 . . . . y_1 y_2 . . . . Z which are calculated and arranged in the following manner :—

Let us examine the case of the second type of radiograms :

QLLL x_1 — x_1 is equal to the significant cipher of the units of the sum Q + L + L + L.
llllx_2 — x_2 ditto do. of l + l + l + l.
BBDD x_3 — x_3 ditto do. of B + B + D + D.
FVKd x_4 — x_4 ditto do. of F + V + K + d.
wwGG x_5 — x_5 ditto do. of w + w + G + G.
TTtt x_6 — x_6 ditto do. of T + T + t + t.
CNWr x_7 — x_7 ditto do. of C + N + W + r.

y_1 is equal to the significant cipher of the units of Q + l + B + F + w + T + C.
y_2 ditto do. L + l + B + V + w + T + N
y_3 ditto do. L + l + D + K + G + t + W
y_4 ditto do. L + l + D + d + G + t + r.
z = significant cipher of the units of $x_1 + x_2 + \ldots x_7$.

EXAMPLE OF THE WORDING OF A RADIOGRAM.

Let us suppose that an observation is being made on a boat at 7h from the Greenwich meridian and is situated in the Western quadrant of Greenwich, North of the Equator, at 120° 35′ of longitude and 60° 27′ of latitude.

		Numbers telegraphed.
Situation	Quadrant, N.W.	5
	Latitude, 60° 27′ 60.5	605
	Longitude, 120° 35′ 120.6	1206
Barometrical Pressure, 762.4		62
Direction of the wind, N.W.		28
Force of the wind, 3		3

Objects are not seen at a half a mile	3
There is a head sea with heavy swell waves	2
The waves of the swell come from the W.	6
The weather, on making the observation, is clear at the zenith but with a dense mist for some time, beginning to get less dense	24
The time of observation was 7 o'clock	07
The temperature of the air was 11°.4	11
And that of the water 11° .6	12
There are stratus in the sky	0
The amount of overcast sky is eight tenths	8
The weather from the last observation was cloudy	1
It did not rain	0

And the radiogram would be :—Name of the boat 56056 — 12069 — 62288 — 33264 — 24073 — 11125 — 08109 — 86644.

Explanation.

5605 6, $5+6+0+5 = 16$, $x_1 = 6$ $\quad$ $5+1+6+3+2+1+0 = 18$, $y_1 = 8$
1206 9, $1+2+0+6 = 9$, $x_2 = 9$ $\quad$ $6+2+2+3+4+1+8 = 26$, $y_2 = 6$
6228 8, $6+2+2+8 = 18$, $x_3 = 8$ $\quad$ $0+0+2+2+0+1+1 = 6$, $y_3 = 6$
3326 4, $3+3+2+6 = 14$, $x_4 = 4$ $\quad$ $5+6+8+6+7+2+0 = 34$, $y_4 = 4$
2407 3, $2+4+0+7 = 13$, $x_5 = 3$
1112 5, $1+1+1+2 = 5$, $x_6 = 5$
0810 9, $0+8+1+0 = 9$, $x_7 = 9$

8664 4

$$x_1 - x_2 - x_3 - x_4 - x_5 - x_6 + x_8 = 44 \quad z = 4$$

SWEDEN

Transmitting station : Karlsborg (call signal SAJ).
Wavelength : 4,200 m. C.W.
Times of transmission : 0840 (G.M.T.) (Observations at 0700 G.M.T.)
1440 ,, ,, ,, 1300 ,,
1940 ,, ,, ,, 1800 ,,

Observations relate to the following stations :—

Station No.	Station.	Notes.
03	Abisko....	Code A (below), see also (*a*)
11	Haparanda	Code A
15	Stensele	Code A
22	Ostersund	Code A
24	Hërnösand	Coastal station, Code B (below)
28	Saerna	Code A
36	Karlstad	Code A
37	Stockholm	Code A
48	Jönköping	Code A
52	Wisby	Coastal station, Code B
58	Kalmar	Coastal station, Code B

Code A.—For 7h. reports BBBDD FwwTT cbWVH ALaNh RRmmr.
For 13h. and 19h. reports BBBDD FwwTT cbWVH ALaNh RRmmr.

Code B.—For 7h. reports BBBDD FwwTT cbWVH ALaNh RRSv$_5$r.
For 13h. and 18h. reports BBBDD cbWVH RRSv$_5$r.

(*a*).—03 Abisko also issues a final group of nephoscope observations in code C_1ddVV. The unit VV is such that if h is the height of the cloud in metres, the true velocity vv is given in metres per second by the equation—

$$vv = \frac{h}{1000} V.$$

NOTES.—Additional stations may be inserted in place of the above normal stations, which may fail occasionally.

Pilot balloon ascents are added from time to time at the end of the morning and afternoon messages. These ascents are taken the same morning at the following stations :—

03 Abisko, 22 Östersund, 37 Stockholm.

Code : $h_1$ddvv in metres per second.

Meteorological messages containing the weather forecasts, prepared by the Central Meteorological Institute in Stockholm, are sent out at request to ships from the stations of Boden, Hernösand, Vaxholm, Gottland, Karlskrona and Gothembourg. The five last-named stations also give information concerning ice. Thus the station of Hernösand furnishes ice reports from the district between the light-place of Svartklubben and the pilot station of Salmi, the stations of Vaxholm and Gottland from the district between the light-place of Olands södra udde and the pilot station of Salmi, the station Karlskrona from the district between the light-place of Kullen to the pilot Station of Salmi and the station of Gothembourg from the district between the pilot station of Dyngö and the pilot station of Aspö.

The information is given in plain language. A charge of 8 francs is collected from the ships for each transmission of a weather or ice report.

Compass Station :—Vinga (call signal SAL), position 11° 30′ 10″ E. ; 57° 38′ 00″ N. Wavelength 600 m. (Vinga is controlled by Göteborg.)

Ships desiring compass bearing should call Göteborg sending QTE (quel est mon relèvement vrai depuis . . . .). Then the ship should await instructions. Göteborg gives the result by means of the signal QTE (votre relèvement vrais depuis . . . . était de . . . . degrés) followed by the call signal of the station having determined the bearing and a group of three figures (000 to 359). This group indicates in degrees measured clockwise the true bearing of the ship from Vinga. Immediately after receiving the result the ship should acknowledge in the ordinary way and give signal "fin de travail" which is repeated by Göteberg. No tax is collected for the bearings.

A brief report of the result should be sent to "Administration Générale des Télégraphes, Division radio-télégraphique, Stockholm 2."

TUNIS (North Africa)

Transmitting station : Bizerta (Sidi-Abdallah, FUA)

Wavelength : 1,350 m. Spark at 12.00 (G.M.T.) ; 5150 m. C.W. at other times.

Times of sending :				
0315	(Observations	at	0100	G.M.T.)
0920	,,	,,	0700	,,
1200	,,	,,	0700	,,
1500	,,	,,	1300	,,
2020	,,	,,	1800	,,

The 1200 message commences with the words "Meteo Alger" ; the remaining messages with the words "Meteo Afrique."

0315 *Message.*—0100 Observations from Tunis.

Code: BBBDD FWTT βbb

This is followed by a repetition of the 0300 report from Oran.

0920 *Message.*—0700 Observations from—

61 Tunis.
62 Bizerta (Carouba)
63 Sfax.

Code: Station number (two figures) BBBDD FWTTV βbbRR MMmmu.
Where V denotes visibility (special code, *see* Algeria).
Groups giving upper winds in the Eiffel Tower Code may be added for Bizerta.
The message also contains a repetition of the 0900 report from Oran.

NOTE.—The observation of state of sea in groups relating to Bizerta is made at Cap Blanc.

1500 *and* 2020 *Messages.*—1300 and 1800 observations respectively from the above Tunisian Stations, together with a repetition of the 1445 and 2000 reports, respectively from Oran.
Code: BBBDD FWTT βbb.
1200 *Message.*—The same as that from Oran at 1145 with the addition of the stations:—

Sfx. = Sfax (S)		
Bzr. = Bizerta (Carouba) (S)		
Gar. = Cap de Garde (S)	}	(S) = Coastal Station.
Cst. = Constantine (L)		(L) = Inland Stations.
Tgr. Tangier (S)		
Rab. Rabat (S)		

TURKEY

Weather reports are issued three times daily from Constantinople (OSM) at 0830, and 1700 (G.M.T.)

[Observations at 0500 and 0800 for 0830 message and 1500 for 1700 message.]

Wavelength: 8,000 m. C.W.

Messages commence "Meteo Constantinople a FL pour PHISERAR PARIS"—then date and hour followed by observations from Constantinople

Code: Old International.
Message of 5h., BBBDD FWTTC βbbRR MMmm.
Messages of 8h. and 15h., BBBDD FWTTC βbbRR.

UNITED STATES OF AMERICA

TRANSMISSION OF TIME SIGNALS AND HYDROGRAPHIC INFORMATION BY NAVAL RADIO STATIONS.

The transmission of time signals to vessels at sea by means of radiotelegraphy was first accomplished in the United States in 1905, and this service, enlarged and extended, has continued to the present time. This service is of the greatest value to mariners, as it furnishes a means by which the time, as given by the transmitted signals, may be compared with a ship's chronometer and the error of the chronometer found. Similar comparisons over a number of days enable data to be obtained by which not only the error may be found but also the chronometer rate; that is, the rate at which it is gaining or losing.

The noontime signals on the Atlantic coast are sent out through the coast radio stations by connection with Western Union Telegraph lines from the United States Naval Observatory at Washington, D.C. By the operation of proper relays in electrical circuits, the beats of the seconds of a standard clock

in the observatory are sent out broadcast as a series of radio dots, commencing five minutes before the time of the final signal. By omitting certain dots in a series, the comparison between the dots and the beats of the chronometer seconds can be checked until the instant of local noon (seventy-fifth meridian time) is reached. This is marked by a longer dot, which gives the time of exact noon. A comparison with the chronometer time at that instant gives its error referred to the seventy-fifth meridian time. Applying the difference in longitude, namely five hours, between the seventy-fifth meridian and Greenwich, which is the standard meridian (or 0° longitude), the error of the chronometer referred to Greenwich time is determined.

Time signals are now sent out on the Atlantic coast only through the radio stations at Washington (NAA), Annapolis (NSS), Key West (NAR), and New Orleans (NAT). Signals from Washington, Annapolis and Key West are sent out every day in the year twice a day, *viz.*, from 11.55 a.m. to noon, and from 9.55 to 10 p.m., seventy-fifth meridian time. Time signals from New Orleans are sent out daily, including Sundays and holidays, commencing at 11.55 a.m., seventy-fifth meridian standard time, and ending at noon.

On the Pacific coast the time signals are sent broadcast to sea through the naval radio stations at San Francisco (NPH), Eureka (NPW), Point Arguello (NPK), and San Diego, Calif. (NPL), and at North Head, Wash. (NPE). The controlling clock for each station is in the naval observatory at the Mare Island Navy Yard. Signals from all these stations are sent out every day from 11.55 to noon, one hundred and twentieth meridian standard time, but point Arguello, and San Diego do not send on Sundays and holidays.

On the Great Lakes the time signals are sent broadcast through the naval radio station at Great Lakes, Ill. (NAJ), daily, except on Sundays and holidays, from 10.55 a.m. to 11 a.m., ninetieth meridian standard time.

To get the maximum clearness of signals, the receiving circuit should be tuned to that of the sending station. The wavelengths used are as follows :—

Annapolis	17,000 metres.
Washington	2,500 metres.
San Francisco	2,400 and 4,800 metres.
North Head	2,800 metres.
San Diego	2,400 and 9,800 metres.
Eureka	2,000 metres.
Great Lakes	1,512 metres.
Key West	1,500 metres.
Point Arguello	1,512 metres.
New Orleans	1,000 metres.

Both San Francisco and San Diego transmit time signals on undamped waves simultaneously with the transmission on damped waves, using an arc transmitter in each case. The arc transmitter is far more powerful than the spark transmitter, and the signals should be audible over a much greater range. They can, of course, only be received on apparatus specially equipped to receive undamped signals.

PANAMA.

Time is transmitted by Balboa (Canal Zone), call letters NBA, at 12.55 to 1 p.m. and at 4.55 to 5 a.m., seventy-fifth meridian time, on 7,000 metres. Undamped waves are used, but so interrupted by a chopper as to be audible on a crystal detector.

Also time is transmitted by Colon (Canal Zone), call letters NAX, at the same times, on 1,500-metre spark.

In this connection it will be noted that Darien has been operated by distant control from Balboa. The station is called Balboa, and the call NBA is used for both.

At 1 p.m. daily, seventy-fifth meridian time, a time-ball is dropped from the top of the mast on the Signal Station on Sosa Hill, Balboa.

The following table summarises the issues in a convenient form :—

Station.	Call Letters.	Wave-Lengths.	When sent.
		Metres.	
Washington	NAA	2,500	Daily at 11.55 a.m. to noon and 9.55 p.m. to 10.00 p.m., standard time, 75th meridian. 1655–1700, 0255–0300 G.M.T.
Annapolis	NSS	17,000 (arc)	Daily at 11.55 a.m. to noon and 9.55 p.m. to 10.00 p.m. standard time, 75th meridian. 1655–1700, 0255–0300 G.M.T.
Key West	NAR	1,500	Daily at 11.55 a.m. to noon, standard time, 75th meridian. 1655–1700 G.M.T.
New Orleans	NAT	1,000	Daily at 11.55 a.m. to noon, standard time, 75th meridian. 1655–1700 G.M.T.
Balboa, Panama ..	NBA	7,000 (arc)	Daily at 4.55 to 5.00 a.m. and 12.55 to 1.00 p.m., standard time, 75th meridian. 0955–1000, 1755–1800 G.M.T.
Colon, Panama ..	NAX	1,500 (spark)	Daily at 4.55 to 5.00 a.m. and 12.55 to 1.00 p.m., standard time, 75th meridian, 0955–1000, 1755–1800 G.M.T.
Cavite, Philippines ..	NPO	952 (spark) 5,000 (arc)	Daily at 10.55 to 11.00 a.m. and 9.55 to 10.00 p.m., standard time, 120th meridian, East. 0255–0300, 1355–1400 G.M.T.
North Head, Wash. ..	NPE	2,800	Daily at 11.55 a.m. to noon, standard time 120th meridian, West. 1955–2000 G.M.T.
Eureka, Calif. ..	NPW	2,000	Daily at 11.55 a.m. to noon, standard time, 120th meridian, West. 1955–2000 G.M.T.
Point Arguello, Calif.	NPK	1,512	Daily, except Sundays and holidays, at 11.55 a.m. to noon, standard time, 120th meridian, West. 1955–2000 G.M.T.
San Diego, Calif. ..	NPL	9,800 (arc) 2,400 (spark)	Daily, except Sundays and holidays, at 11 55 a.m to noon, standard time, 120th meridian, West. 1955–2000 G.M.T.
San Francisco, Calif. ..	NPH	4,800 (arc) 2,400 (spark)	Daily at 11.55 a.m. to noon, standard time, 120th meridian, West. 1955–2000 G.M.T.
Great Lakes, Ill. ..	NAJ	1,512	Daily, except Sundays and holidays, at 10.55 a.m. to 11.00 a.m., standard time, 90th meridian. 1655–1700 G.M.T.
Pearl Harbour, Hawaii	NPM	11,200 (arc) 600 (spark)	Daily at 180th meridian mean noon. 2400 G.M.T.

INFORMATION RELATING TO HYDROGRAPHIC REPORTS.

To Masters of All Vessels.

(1) The Hydrographic Office and the Naval Communication Service are prepared, on and after November 10th, 1921, to collect and distribute hydrographic information by naval radio. The co-operation of owners, operators, radio companies controlling installations on board vessels, and masters, is necessary to make this new undertaking a success. In return, greater protection will be afforded mariners than ever before.

In addition to distributing hydrographic information by radio, the Hydrographic Office will continue to publish, as at present, in the Daily Memorandum, Hydrographic Bulletin or Notice to Mariners, confirmation of hydrographic information distributed by radio.

(2) *Expense*.—The naval radio stations will make no charge for reception of messages containing hydrographic information, provided such messages are checked "Govt. Hydro." and will arrange to furnish this information to the nearest Branch Hydrographic Office free. The ship sending charge, if any, will have to be borne by the sending vessel. Any other expense in connection with the receipt and distribution of this information will be borne by the Hydrographic Office.

(3) *Procedure.*—The procedure, as far as masters of vessels are concerned, may be divided into two parts :—

(*a*) Sending hydrographic information to naval radio station ;

(*b*) Receiving information twice daily when in radio range of the distributing station of its zone.

SENDING INFORMATION.

Vessels co-operating in this service should transmit messages in plain English direct to United States Naval Radio Stations as follows :—

ATLANTIC OCEAN.

North of latitude 42° 00′ N., to Boston Naval Radio Station. Call letters, NAD.

Between latitude 39° 30′ N., and 42° 00′ N., to New York Naval Radio Station. Call letters, NAH.

Between latitude 38° 30′ N., and 39° 30′ N., to Philadelphia Naval Radio Station. Call letters, NAI.

Between latitude 33° 00′ N., and 38° 30′ N. (including entrance to Chesapeake Bay) to Norfolk Naval Radio Station. Call letters, NAM.

Chesapeake Bay (except entrance) to Norfolk Naval Radio Station. Call letters, NAM. Or to Baltimore Naval Radio Station. Call letters, NBZ.

South of latitude 33° 00′ N., and north-east of line joining Cape Sable, Florida and Cay Piedras, Cuba, to Charleston Naval Radio Station. Call letters, NAO.

GULF OF MEXICO.

Between the line joining Cape Sable, Florida and Cay Piedras, Cuba, and the line joining Ship Shoal Light, La., and Cape Catoche, Yucatan (including Yucatan Channel) to New Orleans Naval Radio Station. Call letters, NAT.

In the Gulf of Mexico west of the line joining Ship Shoal Light, La., and Cape Catoche, Yucatan, to Galveston Naval Radio Station. Call letters, NKB.

CARIBBEAN SEA.

In the Caribbean Sea, report to Naval Radio Station, Colon. Call letters, NAX.

PACIFIC OCEAN.

Between the Equator and latitude 20° 00′ N., to Balboa Naval Radio Station. Call letters, NBA.

Between latitude 30° 00′ N., and 42° 00′ N., to San Francisco Naval Radio Station. Call letters, NPG.

Between 42° 00′ N., and 46° 00′ N., to North Head Naval Radio Station. Call letters, NPE.

North of latitude 46° 00′ N. (including Puget, Vancouver and Queen Charlotte Sounds, and Alaskan waters) to Seattle Naval Radio Station. Call letters, NVL.

GREAT LAKES.

Lake Ontario and the St. Lawrence River above Montreal, to Buffalo Naval Radio Station. Call letters, NNZ.

Lake Erie, Lake Huron and Georgian Bay, to Cleveland Naval Radio Station. Call letters, NRH.

Lake Michigan to Chicago Naval Radio Station. Call letters, NUR.

Lake Superior, and the waters connecting this lake with Lake Michigan, Lake Huron and Georgian Bay, to Duluth Naval Radio Station. Call letters, NUX.

(4) These naval radio stations stand continuous watch and are prepared to receive hydrographic messages at any time. Vessels should transmit information as soon as they are in normal radio range of the radio station.

Vessels are requested to inform the Hydrographic Office if they have any trouble in " raising " a station or transmitting the hydrographic message.

(5) *Preparation of Message*.—In preparing information for transmission it is desired that messages be concise as consistent with exactness and clearness. The order of the message will be in the order of the importance of the items. To promote uniformity, the following order of subjects is recommended :—

1.—Derelicts and sunken wrecks.
2.—Mines.
3.—Ice.
4.—Aids to navigation adrift.
5.—Floating rafts, logs, wreckage.
6.—Misplaced buoys in approaches to harbours.
7.—Other items considered sufficiently important to broadcast.

NOTE.—It is not intended to forward information by radio unless danger to a vessel is involved, either from collision or a resulting inadequacy of aids to navigation.

(6) *Confirmation*.—Vessels are requested to forward by first mail to the Branch Hydrographic Office concerned a confirmation copy of all radio messages sent.

RECEIVING INFORMATION.

(7) The latest available hydrographic information of each zone will be distributed from its assigned radio station as follows :—

ATLANTIC OCEAN.

(*a*) Information of the zone south of the forty-fifth parallel and northeast of a line joining POINT JUDITH and NANTUCKET SHOAL LIGHT VESSEL and north of the parallel passing through NANTUCKET SHOAL LIGHT VESSEL (at present latitude 40° 37′ 02″ N.) will be broadcasted from Boston Naval Radio Station. Schedule 11.00 a.m., 5.00 p.m. Wavelength, 1,620 AR.

(*b*) Information of the zone included between the parallels 42° 00′ N. and 39° 30′ N. will be broadcasted from the New York Naval Radio Station. It is to be noted that this zone intentionally overlaps the Boston zone. Schedule, 10.30 a.m., 5.00 p.m. Wavelength, 1,832, AR.

(*c*) Information of the zone included between latitude 39° 30′ N. and latitude 38° 30′ N., including the Delaware River and Bay, will be broadcasted from the Philadelphia Naval Radio Station. Schedule, 10.45 a.m., 5.00 p.m. Wavelength, 1,948, AR.

(*d*) Information of the zone included between 38° 30′ N. and 33° 00′ N., the entrance to Chesapeake Bay, Hampton Roads, Newport News and Norfolk, will be broadcasted from the Norfolk Naval Radio Station. Schedule, 10.45 a.m., 4.00 p.m. Wavelength, 1,851, AR.

(*e*) Information of Chesapeake Bay, except Newport News and Norfolk, will be broadcasted from the Baltimore Naval Radio Station. It is to be noted that this overlaps with Norfolk on Hampton Roads and the entrance to Chesapeake Bay. Schedule, 10.30 a.m., 4.00 p.m. Wavelength, 700, AR.

(*f*) Information of the zone south of 33° 00′ N. and northeast of a line joining CAPE SABLE, FLA., and CAY PIEDRAS, CUBA, will be broadcasted from the Charleston Naval Radio Station. Schedule, 10.30 a.m., 6.00 p.m. Wavelength, 2,250, AR.

GULF OF MEXICO.

(*g*) Information of the GULF OF MEXICO between the line CAPE SABLE, FLA. and CAY PIEDRAS, CUBA, and the line SHIP SHOAL LIGHT, LA., and CAPE CATOCHE, YUCATAN, including the YUCATAN CHANNEL, will be broadcasted from the New Orleans Naval Radio Station. Schedule, 11.00 a.m., 5.00 p.m. Wavelength, 1,832, AR.

(*h*) Information of the GULF OF MEXICO, west of the line SHIP SHOAL LIGHT, LA., and CAPE CATOCHE, YUCATAN, will be broadcasted from the Galveston Naval Radio Station. Schedule, 11.30 a.m., 6.30 p.m. Wavelength, 1,813, AR.

CARIBBEAN SEA.

(*i*) Information of the Caribbean Sea will be broadcasted from the Colon Naval Radio Station immediately after radio time signals. Schedule, 5.00 a.m., 1.00 p.m. Wavelength, 1,620, AR.

PACIFIC OCEAN.

(*j*) Information of the zone between the Equator and latitude 20° 00′ N. will be broadcasted from the Balboa Naval Radio Station immediately after radio time signals. Schedule, 5.00 a.m., 1.00 p.m. Wavelength, 10,110, CW.

(*k*) Information of the zone included between latitude 33° 00′ N. and latitude 42° 00′ N. will be broadcasted from the San Francisco Naval Radio Station. Schedule and wavelength will be announced later.

(*l*) Information of the zone included between 42° 00′ N. and 46° 00′ N. will be broadcasted from the North Head Naval Radio Station. Schedule and wavelength will be announced later.

(*m*) Information of the zone north of 46° 00′ N., including VANCOUVER and QUEEN CHARLOTTE SOUNDS and ALASKAN WATERS, will be broadcasted from the Seattle Naval Radio Station. Schedule and wavelength will be announced later.

GREAT LAKES.

(*n*) Information of LAKE ONTARIO and the ST. LAWRENCE RIVER above MONTREAL will be broadcasted from the Buffalo Naval Radio Station. Schedule, 10.45 a.m., 5.00 p.m. Wavelength, 1,200, AR.

(*o*) Information of LAKE ERIE, LAKE HURON and GEORGIAN BAY, will be broadcasted from the Cleveland Naval Radio Station. Schedule, 11.00 a.m., 5.30 p.m. Wavelength, 1,080, AR.

(*p*) Information of LAKE MICHIGAN will be broadcasted from the Chicago Naval Radio Station. Schedule, 11.00 a.m., 5.30 p.m. Wavelength, 1,200, AR.

(*q*) Information of LAKE SUPERIOR, and the waters connecting this lake with LAKE MICHIGAN, LAKE HURON and GEORGIAN BAY, will be broadcasted from the Duluth Naval Radio Station. Schedule, 10.45 a.m., 4.15 p.m. Wavelength, 1,200, AR.

The arrangements for collecting, digesting and distributing hydrographic information are complete; it remains for masters of vessels to make this undertaking a success, for information must be received before it can be distributed.

INTERNATIONAL ICE OBSERVATION AND ICE PATROL SERVICE.

For the purpose of carrying on the International Ice Observation and Ice Patrol Service provided for by the International Convention for the Safety of Life at Sea, London, 1913–14, the U.S. Coastguard cutters *Ossipee* and *Seneca* have been detailed for this service.

The object of the Ice Patrol Service is to locate the icebergs and field ice nearest to the transatlantic steamship lane. It will be the duty of patrol vessels to determine the southerly, easterly, and westerly limits of the ice, and to keep in touch with these fields as they move to the southward, in order that radio messages may be sent out daily, giving the whereabouts of the ice, particularly the ice that may be in the immediate vicinity of the regular transatlantic steam lane.

During the months of April, May, and June, and as much longer as necessary, these two vessels will obtain fuel and other necessary supplies

at Portland, Me., and Boston, Mass., respectively. They will alternate on patrol, making alternate cruises of about fifteen days in the ice region; the fifteen days to be exclusive of time occupied in going to and from base. The movements of the vessels will be so regulated that on the fifteenth day after reaching the ice region the vessel on patrol will be relieved by the second vessel, if possible, at which time the first vessel will proceed to base, replenish her coal supply, and return in time to relieve the other vessel at the end of the latter's fifteen-day cruise. It is important that the patrol be continuous, and the vessel on patrol will not leave her station until relieved by the other vessel unless it is absolutely necessary to do so.

Having located the ice, the patrol vessel will send the following daily radiograms. All time in radiograms will be in 75th meridian time.

(*a*) At 6 p.m. (75th meridian time) ice information will be sent broadcast for the benefit of vessels, using 600 metre wavelength. This message will be sent three times, with an interval of two minutes between each.

(*b*) At 4 a.m (75th meridian time) a radiogram will be sent to the Branch Hydrographic Office, New York City, through the nearest land radio stations, defining the ice danger zone, its southern limits, or other definite ice news. The telegraphic address of the Branch Hydrographic Office is " Hydrographic, New York."

(*c*) Ice information will be given at any time to any ship with which the patrol vessel can communicate.

Ice information will be given in as plain, concise English as practicable, and will state in the following order :—

(*a*) Ice (berg or field).
(*b*) Date.
(*c*) Time (75th meridian time).
(*d*) Latitude.
(*e*) Longitude.
(*f*) Other data as may be necessary.

While on this duty the patrol vessel will endeavour by means of daily radio messages to keep ships at sea advised of the limits of the ice fields, etc.

The radio messages from the patrol ships will be given publicity immediately upon their receipt by the Branch Hydrographic Office, New York, and by the Hydrographic Office, Washington, D.C.

Transmission of Weather Reports by Naval Radio Stations.

Through co-operation with local offices of the United States Weather Bureau, weather forecasts are sent broadcast to sea through naval coast radio stations at certain times, varying with the locality. Coast stations are generally prepared to give local forecasts to passing vessels without charge, on request. Storm warnings are sent whenever received.

General Report.

A general report of weather conditions in America is understood to be issued or about to be issued twice daily from Annapolis (17,000 m.) at 0130 and 1330 G.M.T.

Atlantic and Gulf Coasts.

Distribution of Weather Bulletins and Storm Signals by W/T Stations.

A systematic broadcasting of weather bulletins, storm and hurricane warnings by United States Naval W/T stations on the Atlantic and Gulf Coasts, and in the Carribbean Sea is now in force. This distribution supplements the general broadcasting of weather bulletins and storm signals from the high power W/T stations at Arlington (Virginia), Key West (Florida), Point Isabel (Texas), San Juan (Porto Rico) and Great Lakes (Illinois).

Whenever a storm or hurricane warning is based on the meteorological observations taken at 1300, it will be transmitted at the same time as the weather bulletin. When based on special observations it will be transmitted at the time indicated.

I.—St. Petersburg (Florida) W/T Station.

Position.—Lat. 27° 57′ N., long. 82° 26′ W. (approx.).
Call signal.—NGL.

Wavelength.—2,700 metres.

Details.—At 1630 wind and weather forecasts and storm warnings for west Florida coast, Key West to Apalachicola; advisory messages relating to storm warnings issued for the South Atlantic and Gulf Coasts; and observations taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Tampa and Key West.

At 0000 storm warnings and advices..............................

Hurricane warnings and advisory messages relating thereto sent as necessary and repeated every two hours until 0500.

II.—Pensacola (Florida) W/T Station.

Position.—Lat. 30° 21′ N., long. 87° 16′ W. (approx.).
Call signal.—NAS.
Wavelength.—2,250 metres.

Details.—At 1645 wind and weather forecasts and storm warnings for Florida and Alabama coasts, Apalachicola to Bay St. Louis; advisory messages relating to storm warnings issued for South Atlantic and Gulf Coasts; and observations taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Pensacola.

At 2300 storm warnings and advices..............................

Hurricane warnings and advisory messages relating thereto sent as necessary, and repeated every two hours until 0500.

III.—New Orleans W/T Station.

Position.—Lat. 29° 57′ N., long. 90° 02′ W. (approx.).
Call Signal.—NAT.
Wavelength.—1,832 metres.

Details.—At 1600 wind and weather forecasts and storm warnings for Louisiana and Texas Coasts, Bay St. Louis to Port Arthur; advisory messages relating to storm warnings issued for South Atlantic and Gulf Coasts; and observations taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Burrwood and Port Arthur.

At 2200 storm warnings and advices..............................

Hurricane warngings and advisory messages relating thereto sent as necessary, and repeated every two hours until 0500.

IV.—Galveston W/T Station.

Position.—Lat. 29° 19′ N., long. 94° 47′ W. (approx.).
Call signal.—NKB.
Wavelength.—1,813 metres.

Details.—At 1630 wind and weather forecasts and storm warnings for Texas Coast, Port Arthur to Corpus Christi; advisory messages relating to storm warnings issued for the West Gulf Coast; and observations taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Galveston.

At 2300 storm warnings and advices..............................

Hurricane warnings and advisory messages relating thereto send as necessary, and repeated every two hours until 0500.

V.—Point Isabel (Texas) W/T Station.

Position.—Lat. 26° 04′ N., long. 97° 12′ W. (approx.).
Call signal.—NAY.
Wavelength.—2,250 metres.

Details.—At 1700 wind and weather forecasts and storm warnings for Texas Coast, Corpus Christi to Brownsville; advisory messages relating to storm warnings issued for the West Gulf Coast.

At 0000 storm warnings and advices..............................

Hurricane warnings and advisory messages relating thereto send as necessary, and repeated every two hours until 0500.

VI.—Portland (Maine) W/T Station.

Position.—Lat. 43° 34′ N., long. 70° 12′ W. (approx.).
Call Signal.—NAB.
Wavelength.—1,620 metres.

Details.—At 1700 wind and weather forecasts and storm warnings for Maine Coasts Eastport to Portsmouth; advisory messages regarding storm warnings issued for North Atlantic Coast; and observations taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Portland.

At 0100 storm warnings and advices..............................

VII.—Boston (Massachusetts) W/T Station.

Position.—Lat. 42° 21′ N., long. 70° 57′ W. (approx.).
Call signal.—NAD.
Wavelength.—2,250 metres.

Details.—At 1600 wind and weather forecasts and storm warnings for New Hampshire, Massachusetts, and Rhode Island Coasts; advisory messages regarding storm warnings issued for North Atlantic Coast; and observation taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Highland Light, Nantucket and Block Island.

At 2200 storm warnings and advices..............................

VIII.—New York W/T Station.

Position.—Lat. 40° 28′ N., long. 74° 00′ W. (approx.).
Call signal.—NAH.
Wavelength.—1,832 metres.

Details.—At 1530 wind and weather forecasts and storm warnings for New York and Connecticut Coasts; forecasts Sandy Hook to Grand Banks for European steamers; advisory messages regarding storm warnings issued for north and middle Atlantic Coasts; and observations taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Sandy Hook.

At 2200 storm warnings and advices..............................

IX.—Philadelphia W/T Station.

Position.—Lat. 39° 52′ N., long. 75° 11′ W. (approx.).
Call signal.—NAI.
Wavelength.—1,948 metres.

Details.—At 1545 wind and weather forecasts and storm warnings for New Jersey, Delaware and Maryland Coasts; advisory messages regarding storm warnings issued for north and middle Atlantic Coasts; and observations taken at 1300 for wind direction and velocity, and state of weather at Delaware breakwater.

At 2200 storm warnings and advices..............................

X.—Baltimore (Maryland) W/T Station.

Position.—Lat. 39° 17′ N., long. 76° 37′ W. (approx.).
Call signal.—NBZ.
Wavelength.—700 metres.

Details.—At 1530 wind and weather forecasts and storm warnings for Chesapeake Bay; advisory messages regarding storm warnings issued for middle and South Atlantic Coasts; and observations taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Baltimore and Norfolk.

At 2100 storm warnings and advices..............................

XI.—Norfolk (Virginia) W/T Station.

Position.—Lat. 36° 50′ N., long. 76° 18′ W. (approx.).
Call signal.—NAM.
Wavelength.—1,851 metres.

Details.—At 1515 wind and weather forecasts and storm warnings for Virginia and North Carolina Coasts; advisory messages regarding storm warnings issued for Chesapeake Bay and middle and South Atlantic Coasts.

At 0100 and 2100 storm warnings and advices.....................

Advisory messages regarding hurricanes are sent when necessary and repeated every two hours until 0500.

Observations taken at 0100 and 1300 for barometric pressure, state of weather, wind direction and velocity, condition of sea and visibility at Cape Henry and Cape Hatteras are sent at 0130 and 1330 respectively.

XII.—Charleston (South Carolina) W/T Station.

Position.—Lat. 32° 51′ N., long. 79° 58′ W. (approx.).
Call signal.—NAO.
Wavelength.—2,250 metres.

Details.—At 1530 wind and weather forecasts and storm warnings for South Carolina Coast; advisory messages relating to storm warnings issued for middle, South Atlantic and East Gulf Coasts; and observations taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Charleston.

At 2300 storm warnings and advices..............................

Hurricane warnings and advisory messages relating thereto sent as necessary and repeated every two hours until 0500.

XIII.—Savannah (Georgia) W/T Station.

Position.—Lat. 32° 05′ N., long. 81° 07′ W. (approx.).
Call signal.—NEV.
Wavelength.—1,813 metres.

Details.—At 1600 wind and weather forecasts and storm and hurricane warnings for Georgia Coast; advisory messages relating to storm warnings issued for middle and South Atlantic and East Gulf Coasts; and observations taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Savannah.

At 2300 storm warnings and advices..............................

Hurricane warnings and advisory messages relating thereto sent as necessary and repeated every two hours until 0500.

XIV.—Jacksonville (Florida) W/T Station.

Position.—Lat. 30° 19′ N., long. 81° 39′ W. (approx.).
Call signal.—NFI.
Wavelength.—450 metres.

Details.—At 1600 wind and weather forecasts and storm and hurricane warnings for east Florida Coast, Jacksonville to Miami; advisory messages relating to storm warnings issued for middle and South Atlantic and East Gulf Coasts; and observations taken at 1300 for barometric pressure; wind direction and velocity, and state of weather at Jacksonville and Titusville.

At 2300 storm warnings and advices issued in afternoon..............

Hurricane warnings and advisory messages relating thereto sent as necessary, and repeated every two hours until 0000.

XV.—St. Augustine (Florida) W/T Station.

Position.—Lat. 29° 53′ N., long. 81° 17′ W. (approx.).
Call signal.—NAP.
Wavelength.—1,851 metres.

Details.—At 1630 wind and waether forecasts and storm warnings for East Florida Coast, Jacksonville to Miami; advisory messages relating to storm warnings issued for middle and South Atlantic and East Gulf Coasts; and observations taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Jacksonville and Titusville.

At 0000 storm warnings and advices issued in afternoon..............

Hurricane warnings and advisory messages relating thereto sent as necessary, and repeated every two hours until 0500.

XVI.—Maimi (Florida) W/T Station.

Position.—Lat. 25° 48′ N., long. 80° 08′ W. (approx.).
Call signal.—NGE.
Wavelength.—1,620 metres.

Details.—At 1630 wind and weather forecasts and storm warnings for East Coast of Florida, Miami to Key West; advisory messages relating to storm warnings issued for the middle and South Atlantic and East Gulf Coasts; and observations taken at 1300 for barometric pressure, wind direction and velocity, and state of weather at Miami.

At 2300 storm warnings and advices issued in afternoon..............

Hurricane warnings and advisory messages relating thereto sent as necessary, and repeated every two hours until 0500.

XVII.—St. Croix (Virgin Is.) W/T Station.

Position.—Lat. 17° 45′ N., long. 64° 42′ W. (approx.).
Call signal.—NNL.
Wavelength.—450 metres.

Details.—Hurricane and advisory messages relating thereto are transmitted when issued by the San Juan (Porto Rico) Weather Bureau and are repeated every four hours.

XVIII.—St. Thomas (Virgin Is.) W/T Station.

Position.—Lat. 18° 20′ N., long. 64° 56′ W. (approx.).
Call signal.—NBB.
Wavelength.—1,688 metres.

Details.—Hurricane warnings and advisory messages relating thereto are transmitted when issued by the San Juan (Porto Rico) Weather Bureau and are repeated every four hours.

XIX.—Port au Prince (Haiti) W/T Station.

Position.—Lat. 18° 34′ N., long. 72° 20′ W. (approx.).
Call signal.—NSC.
Wavelength.—2,250 metres.

Details.—Hurricane warnings and advisory messages relating thereto are transmitted when issued by the Washington Weather Bureau and are repeated every four hours.

XX.—Guantanamo (Cuba) W/T Station.

Position.—Lat. 19° 55′ N., long. 75° 09′ W. (approx.).
Call signal.—NAW.
Wavelength.—2,750 metres.

Details.—Hurricane warnings and advisory messages relating thereto are transmitted when issued by the Washington Weather Bureau and are repeated every four hours.

Note.—The times given throughout are G.M.T. (civil).

All bulletins begin with the letters U S W B (United States Weather Bureau) and the weather conditions follow. The first three figures of a report represent the barometric pressure in inches (002 = 30.02); the next figure, the fourth in sequence, represents the direction of the wind to the eight points of the compass: 1 = north, 2 = north-east, 3 = east, 4 = south-east, 5 = south, 6 = south-west, 7 = west, 8 = north-west, and 0 = calm. The fifth figure represents the force of the wind on the Beaufort Scale.

In order to simplify the code, no provision has been made for wind force greater than 9, strong gale, on the Beaufort Scale. Whenever winds of force greater than 9 occur, the number representing them is given in words of figures, thus: Ten, eleven, etc.

PACIFIC COAST

Weather bulletins are obtained from the Weather Bureau, San Francisco, by the San Francisco Naval Radio Station at about 8.30 a.m. and 6 p.m., and forwarded by radio to North Head and San Diego as soon as practicable. They are broadcasted by San Francisco, North Head, and San Diego at noon and 10 p.m. on 952 metres immediately after transmission of time signals. Hydrographic information and storm warnings are broadcasted immediately upon receipt by Tatoosh. Puget Sound, North Head, Marshfield, San Francisco, and Point Arguello on 600 and 952 metres in succession, and also after broadcasting local weather report. Local weather reports broadcasted by Tatoosh, North Head, San Francisco and San Diego at 8 a.m. and 4 p.m. on 600 metres and at noon and 10 p.m., 952 metres; and at noon and 10 p.m., by Puget Sound, Marshfield and Point Arguello on 600 meters. Weather report from Farallones Islands is forwarded to San Francisco for Marine Exchange at 8 a.m., noon, and 5 p.m.

The daily bulletin broadcasted by San Francisco, North Head, and San Diego will consist of two parts as for Atlantic coasts.

The points on the Pacific coast from which weather conditions will be furnished are—

T = Tatoosh.
NH = North Head.
E = Eureka.
SF = San Francisco.
SD = San Diego.

The bulletin will begin with the letters U S W B S F, signifying United States Weather Bureau, San Francisco, and the weather conditions will follow in the same code as for Atlantic coasts.

If the weather conditions for any station cannot be supplied, the initial of the station will be given, followed by the word "Missing"; and if any portion of a report cannot be furnished, such porton will be replaced by an equivalent number of letters, X.

The coast line of the western part of the United States will be divided as follows:—

Northern Pacific, Tatoosh to Cape Blanco.
Central Pacific, Cape Blanco to Point Arguello.
Southern Pacific, Point Arguello to San Diego.

The forecast and warning will be in ordinary language, and will cover a period of 24 hours from 5 p.m., date of issue. At the end of the forecast a statement will be made in regard to the location and movement of any barometric depression that may be likely to affect the winds over the ocean.

Example of forecast and warnings:
Northern Pacific missing Central Pacific Wednesday rain heavy southeast winds Southern Pacific moderate southerly winds period Southeast storm warnings displayed Pointarguello to Capeblanco.

PANAMA (CANAL ZONE).

Hydrographic information and weather reports, when received, are broadcasted immediately after 5 a.m. and 1 p.m. time at Balboa (NBA) on 7,000 metres (arc) and by Colon (NAX) on 1,500 metres (spark). At 5 a.m. Balboa (NBA) also broadcasts this information on 2,400 metres spark.

In addition to above, hydrographic information and weather warnings are broadcasted for ships in the Atlantic by Colon (NAX) and, for ships in the Pacific, Cape Mala (NNT), on 600 metres, immediately after receipt and at 8 a.m., noon, 4 p.m., and 8 p.m. (75th meridian time).

Radio Compass Stations.

Radio compass stations have been installed on the Atlantic coast for the purpose of supplying vessels with bearings and positions. These stations are divided into two classes—those operating independently, and others, called harbour-entrance stations, operated under the control of a central control station at harbour entrances in order to guide vessels to the entrance buoys. The independent stations have been located with a view to giving good cross bearings to ships which are not over 150 miles distant from the coast, while the harbour-entrance stations have been located with a view to furnishing vessels with positions when they are within 50 miles of the entrance to the outer channel.

Harbour-entrance radio compass stations differ from those acting independently in that they are connected to and controlled by a central control station.

Instructions Concerning Radio Compass Stations.

1. There follows a list of harbour-entrance radio compass stations:

Harbour entrance.	Compass-control station.	Radio call.
Boston, Mass.	Boston	NAD
New York, N.Y.	New York	NAH
Delaware Capes	Cape May	NSD
Chesapeake Capes	Virginia Beach	NCZ

The following radio compass stations take bearings for Boston:

Place.	Position. Latitude.	Position. Longitude.
	° ′ ″	° ′ ″
Gloucester, Mass.	42 35 19 N	70 41 08 W
Deer Island, Mass.	42 21 15 N	70 57 30 W
Fourth Cliff, Mass.	42 09 40 N	70 42 22 W

The following radio compass stations take bearings for New York :

Place.	Position.					
	Latitude.			Longitude.		
	°	′	″	°	′	″
Fire Island, N.Y.	40	38	07 N	73	12	32 W
Rockaway Beach, Long Island	40	33	52 N	73	52	40 W
Sandy Hook, N.J.	40	28	12 N	74	01	06 W
Mantoloking, N.J.	40	01	30 N	74	03	10 W
Montauk, Long Island	41	03	09 N	71	57	27 W

The following radio compass stations take bearings for Cape May :

Place.	Position.					
	Latitude.			Longitude.		
	°	′	″	°	′	″
Cape May, N.J.	38	56	41 N	74	53	10 W
Cape Henlopen, Del.	38	47	26 N	75	05	10 W
Bethany Beach, Del.	38	32	45 N	75	03	20 W

The following radio compass stations take bearings for Virginia Beach :

Place.	Position.					
	Latitude.			Longitude.		
	°	′	″	°	′	″
Hog Island, Va.	37	22	36 N	75	42	37 W
Smith Island, Va.	37	07	08 N	75	53	42 W
Cape Henry, Va.	36	55	16 N	75	59	51 W

2. To obtain a bearing from independent radio compass stations, call the station from which the bearing is desired in the usual manner and request bearings by means of a conventional signal given below. Simultaneous bearings from two or more compass stations can be obtained by making the call include the other compass stations desired.

3. To obtain bearings from harbour-entrance compass stations carry out the same procedure with the exception that the compass-control station should be called instead of the compass station.

4. When bearings are requested simultaneously from two or more compass stations the compass station which is farthest north will supply the ship with its bearing first ; the others will then follow in the order of their north to south, or east to west, geographical location.

5. The following abbreviated signals will be used until further notice :

Signal.	Meaning.
QTE ?	What is my true bearing ?
QTE	Your true bearing is ——— degrees from ——— radio compass station.
QTF ?	What is my position ?
QTF	Your position is latitude ———, longitude ———.

6. The radio compass station (or compass-control station for harbour-entrance compass stations) will answer requests for bearings and positions in the customary manner of answering calls and follow their call letters with " K " if they desire to take a bearing at that time, " QRX " if they desire the vessel to stand by, or other abbreviated signal authorised by International Regulations.

7. On being told to " K " vessels desiring bearings or positions will transmit their radio call letters for 30 seconds and then make dashes 5 seconds

long for 1 minute, making their call letters 3 times after each 5-second dash and terminating with the conventional signal " K " (go ahead).

8. At the expiration of the direction-determining signals the radio compass station (or compass-control station) will call the vessel, make " QTE," and send the bearing in degrees (0 to 359) and the name of the compass station which obtained the bearing, or " QTF " and the position in latitude and longitude. Bearings and positions will always be transmitted to the vessel in words to avoid error.

9. Vessels acknowledge receipt of bearings and positions by making the call letters of the station transmitting the bearing or position once, " DE," vessel's radio call letters, and then repeats the bearing or position received using numerals.

10. Independent radio compass stations keep watch on 800 metres spark, and this wavelength should always be used to call these stations.

11. Merchant vessels will call all radio compass and compass-control stations on 800 metres and carry out all tests and communication with them thereafter on this wavelength.*

12. Commanders of vessels should note that shore radio compass stations cannot distinguish between the bearing of a ship and its reciprocal unless the reciprocal bears inland. There is, therefore, a possibility of an error of 180 degrees. In such cases the decision is left to the commander of the ship as to which is the correct bearing.

13. Subject to the foregoing, bearings should be accurate within 2 degrees of arc. When bearings from three or more compass stations are not over 2 degrees of an arc in error, but do not meet at a fixed point, the centre of an area enclosed by the bearings can generally be taken as the approximate position of the vessel.

14. The following U.S. naval shore radio compass stations are now in operation for the purpose of furnishing bearings to vessels in the West Atlantic :

Radio Compass Station.	Radio Call.	Position.	
Gloucester, Mass. ..	NAD	Lat. 42° 35′ 19″ N	Long. 70° 41′ 08″ W
Deer Island, Mass. ..	NAD	Lat. 42° 21′ 15″ N	Long. 70° 57′ 30″ W
Fourth Cliff, Mass. ..	NAD	Lat. 42° 09′ 40″ N	Long. 70° 42′ 22″ W
Cape Cod, Mass.	NAE	Lat. 42° 02′ 58″ N	Long. 70° 04′ 32″ W
Surfside, Nantucket, Mass.	NBS	Lat. 41° 14′ 42″ N	Long. 70° 05′ 56″ W
Price's Neck, R.I. ..	NAF	Lat. 41° 27′ 06″ N	Long. 71° 20′ 15″ W
Watch Hill, R.I. ..	NAF	Lat. 41° 18′ 21″ N	Long. 71° 51′ 29″ W
Tatoosh Island, Wash.	NPD	Lat. 48° 23′ 41″ N	Long. 24° 44′ 33″ W
Montauk, L.I.	NAH	Lat. 41° 03′ 09″ N	Long. 71° 57′ 27″ W
Fire Island, N.Y. ..	NAH	Lat. 40° 38′ 07″ N	Long. 73° 12′ 32″ W
Rockaway Beach, N.Y.	NAH	Lat. 40° 33′ 52″ N	Long. 73° 52′ 40″ W
Sandy Hook, N.J. ..	NAH	Lat. 40° 28′ 12″ N	Long. 74° 01′ 06″ W
Mantoloking, N.J. ..	NAH	Lat. 40° 01′ 30″ N	Long. 74° 03′ 10″ W
Cape May, N.J.	NSD	Lat. 38° 56′ 41″ N	Long. 74° 53′ 10″ W
Cape Henlopen, Del. ..	NSD	Lat. 38° 47′ 26″ N	Long. 75° 05′ 16″ W
Bethany Beach, Del. ..	NSD	Lat. 38° 32′ 45″ N	Long. 75° 03′ 20″ W
Hog Island, Va.	NCZ	Lat. 37° 22′ 36″ N	Long. 75° 42′ 37″ W
Smith Island, Va. ..	NCZ	Lat. 37° 07′ 08″ N	Long. 75° 53′ 42″ W
Cape Henry, Va. ..	NCZ	Lat. 36° 55′ 16″ N	Long. 75° 59′ 51″ W
Cape Hatteras, N.C. ..	NDW	Lat. 35° 14′ 22″ N	Long. 75° 31′ 42″ W
Cape Lookout, N.C. ..	NAN	Lat. 34° 36′ 13″ N	Long. 76° 32′ 15″ W
Morris Island, S.C. ..	NAO	Lat. 32° 41′ 33″ N	Long. 79° 53′ 15″ W

NOTE.—The following radio compass stations are temporarily out of commission : Fourth Cliff, Mass. ; Cape Cod, Mass. ; Surfside, Nantucket, Mass. ; Price's Neck, R.I. ; Watch Hill, R.I. ; and Rockaway Beach, N.Y.

* On and after April 1st, 1920, the 800-metre wavelength and no other will be used by all United States Naval shore radio compass stations.

Where two or more of the foregoing compass stations have the same radio call it indicates that they are connected by wire telegraph to and under the control of a central control station, the radio call being the call of the central control station. When a request for bearings is made the central control station invariably answers with a bearing from each of the compass stations under its control.

URUGUAY

The Station of Cerrito radiates each day (excepting Sunday) between 10 p.m. and 11 p.m. (Greenwich mean time) a radiotelegram, issued by the International Meteorological Institute which contains the following information;

(*a*) The situation of centres of atmospheric movement in the southern part of the Continent in the zone between latitude 22° and the extreme south.

(*b*) Observations made at 12.20 p.m. (Greenwich mean time) by the Central Observatory at Monte Video and by stations of the National Service.

(*c*) The most important changes observed between 12.20 and 9 p.m. (Greenwich mean time).

NOTE.—For the wording of this radiotelegram the International Meteorological Telegraph Code will be used.

VIRGIN ISLANDS.

Transmitting Station: St. Croix, NNT. Position 17° 45′ N.; 64° 42′ W.

Wavelength: 450 m.

Hurricane warnings and advisory messages relating thereto are transmitted when issued by the San Juan Weather Bureau, and repeated every four hours.

YUGO-SLAVIA.

Transmitting Station: Belgrade, HFB.

Wavelength: 6500 C.W. Position 44° 48′ N.; 20° 22′ E.

A weather bulletin is issued daily at 1345 G.M.T.

SPECIAL ARTICLES SECTION

(A) National Résumés of the Technical Progress of Radio Communication during 1921 :—

Australia
Canada
China
France
Germany
Great Britain
Holland
Italy
Japan
New Zealand
Norway
Spain
United States of America

(B) General Articles :—

The Recording of Wireless Signals

The Earthing Resistance of Antennae

The Birth and Early History of Long Distance Wireless Telegraphy

The Rectification Effect in its Relation to the Composition and Structure of Crystals

NATIONAL RÉSUMÉS
OF THE TECHNICAL PROGRESS OF RADIOTELEGRAPHY AND RADIOTELEPHONY IN VARIOUS COUNTRIES DURING 1921

AUSTRALIA.

THE existing wireless services of Australia are catered for by four distinct organisations. The coastal service for communication with ships at sea is carried on by a branch of the Postmaster-General's Department; manufacturing for all services and the conduct of Wireless Service in merchant ships by Amalgamated Wireless (Australasia), Limited; Naval services, ship and ashore, are under the direction of the Naval Board, and Military Aircraft wireless is under control of the Australian Air Force. These four organisations work in close co-operation for the advance and application of wireless.

Control of coast stations and licensing authority for merchant ship and amateur stations was transferred from the Department of the Navy to the Postmaster-General's Department in October, 1919.

The following gives a brief resumé of the progress and development during recent months :—

Administration.—Administration of Wireless Telegraph Act transferred from Minister for the Navy to Postmaster-General.

Wireless Telegraph Act, 1905, modified to include wireless telephony.

Issue of statutory regulations empowering the Minister to issue licenses for experimental stations.

Passing of Commonwealth Navigation Act, including provision for compulsory equipment with wireless to all merchant vessels of 1,000 tons and greater, and all ships (irrespective to size) licensed to carry twelve or more passengers.

(*N.B.*—A recent decision of the High Court excludes all vessels not trading beyond the borders of one state on the ground that the Commonwealth has no jurisdiction over purely intra-state vessels.)

Commercial.—All shipowners using wireless in Australian ships purchased shares in Amalgamated Wireless (Australasia), Limited, thus establishing a co-operative company with shipowners' representatives on the board.

Discussions are proceeding between the Government and the Almagamated Wireless (Australasia), Limited, on the question of establishing a direct commercial service between Australia and England.

Proposals for a direct service are favoured by the Government and the Press.

Constructions.—Manufacture of electronic valves successfully introduced by the Amalgamated Wireless (Australasia), Limited, That Company also designed a complete range of wireless telegraph and wireless telephone stations for inland communication and for inter-island communication, and completed a specially designed equipment approved by the Steamship-owners Association for merchant ships coming under the Navigation Act.

The Postmaster-General's Department are erecting a continuous wave station at Powells River in the Northern territory for communication with private station owners.

The installation of medium power arc stations has been completed at Sydney, Perth and Townsville.

Development.—Wireless telephone experiments have been conducted over various distances by Royal Australian Naval Radio Service, Amalgamated Wireless (Australasia) Limited, and Postmaster-General's Department, and a demonstration of radiotelephony and a short address on Wireless were given by the writer before all members of the Senate and House of Representatives and their friends in Queen's Hall, Federal Parliament House, Melbourne.

A new experimental station especially equipped for long distance reception has been established by the Amalgamated Wireless (Australasia), Limited, at Koo-wee-rup, in Victoria. This station can now receive direct from England, France, Germany and the Atlantic Coast of America, during most hours of the day.

E. T. Fisk.

CANADA.

IN the light of modern advancement in radio communication, the year 1921 witnessed the re-organisation of the various groups of coast stations owned by the Government of Canada, both on the Atlantic Coast and on the Pacific Coast. On the Atlantic the apparatus in several stations has been improved in line with present day requirements, whilst the stations at Cape Ray, Heath Point, Pictou and Partridge Island, erected in the early days of Radio, before the coherer had yet been discarded, were closed.

When Harrington Station has been so equipped as to afford efficient communication between Grindstone and Belle Isle, it is likely that the stations at Port Amour and Point Riche will also be closed.

The Montreal station has been transferred to a more suitable site where it now forms a reliable connecting link between the Great Lakes and the sea, communicating with Kingston on the one side, and Quebec on the other. Three Rivers, lying between Montreal and Quebec, has thus become redundant and will be closed shortly.

In order that local weather conditions in that vicinity may continue to be furnished to vessels requiring them, the lightship at Heath Point will be equipped with apparatus to replace this service, which was formally rendered by the Coast Station at Heath Point, just closed.

The fourth Direction Finding Station on the East Coast has been erected and placed in commission at Red Head near St. John, N.B. In addition to giving ships their bearings on 800 metres, it also undertakes on 600 metres the commercial traffic formerly handled by the Partridge Island station.

On the West Coast the stations at Ikeda Head and Pachena Point have been closed down, and the work of installing a new 20 kW spark equipment at Estevan for improved communication with transpacific ships is rapidly progressing.

Triangle Island station has been transferred to a more accessable place at Bull Harbour, on Vancouver Island.

Albert Bay and Point Grey have been fitted with C.W. apparatus to facilitate the dispatch, without interference to ship work, of inter-station traffic along the coast of British Columbia; Albert Bay, particularly, acting as a central point for handling traffic to and from private stations erected at lumber camps and canneries situate at isolated points not served by land telegraphs.

Stations have been erected at Dartmouth, N.S., High River, Alberta, and Jericho Beach, near Vancouver, for communication with aircraft. High

River and Jericho Beach were used extensively during the past two seasons as bases for communication with aircraft engaged in Forest Fire patrol work.

The discovery of oil in that vast northern territory known as the MacKenzie River Region, hitherto reached only by canoe and Indian Trail, has brought to the fore the necessity of rapid communication, and licenses for the erection of three C.W. Stations at Edmonton, Fort Smith and Fort Norman, have been granted.

The Marconi Wireless Telegraph Company of Canada reports a busy year, and several notable improvements at its stations, particularly at Glace Bay. The year's close will see work on a new experimental station near Montreal well advanced, and in 1922 is expected to bring developments which will mean a great deal to the Canadian Company and to Canada.

In every branch of the Canadian Company's business there has been activity, and this in spite of the adverse commercial conditions prevailing. The changes at Glace Bay and Louisburg make the transatlantic circuit thoroughly up to date, and complete the work commenced with this object by the Marconi Company at Clifden. New equipment includes 24 " MT6 " valves, handling about 2 kW each, and also an earth screen. The aerial resistance has been reduced considerably with the result that the original aerial current is now obtained with one-fifth of the original power input. Louisburg receiving station has been equipped with new superfine " note " tuning gear and auto-recording apparatus in connection with an Undulator relay. The Company's 6 kW continuous wave press-station at Glace Bay, designed for the purpose of transmitting press bulletins to ships on the Atlantic, is operating successfully. Automatic transmission is controlled at Louisburg, and press is sent at 10 p.m., Eastern Standard Time, on a wave-length of 2,800 metres. At La Prairie, near Montreal, a 15 kW experimental station is under construction. Most modern equipment is being installed, and the Canadian Marconi Company states that the work which is being untaken at this point will result in several distinct advances in present methods of handling telegraph traffic. Before commencing construction work at La Prairie, the Company conducted a series of experiments extending over a period of four months.

The use of Marconi wireless telephone apparatus in connection with forestry patrol work is very favourably reported upon by the Department of Lands officials at Vancouver. Marine equipment has been considerably improved.

The growth of amateur radio activity during the past year has been phenomenal. The Company's schools have been conducting special courses to meet the demand for construction suitable for amateur requirements. June saw the birth of Canada's first all-radio publication, *Canadian Wireless*, a monthly magazine devoted exclusively to professional and amateur wireless within the Dominion. While the magazine is published by the Marconi Company, every effort is made to insure its being truly representative of Canadian wireless interests generally.

PROF. A. S. EVE,
McGill University, Montreal.

CHINA.

DURING the last year progress from the technical point of view has been somewhat disappointing, but the want of progress is more apparent than real, for the reason that one cannot judge a nation like China from the same standpoint as one would Western countries. The Chinese are interested in radiotelegraphy, and from their point of view have

made rapid progress since the European War of 1914-1918. The majority of people who are not familiar with China are unable to realise the immense distances and the difficulties of transportation, hence when it is reported that a station is under construction, they are surprised at the time which elapses before the station is completed.

The 25 kW arc station at Urga (the capital of Mongolia) stated to be under construction in last year's issue, was completed in February, 1921, and was taken over by the Board of Communications. It was in communication with Peking, a distance of 800 miles, for three weeks, when the city was attacked by Mongols, and the station put out of action. It is expected to be in working order again in about six months time. The two stations to be erected at Urumsti and Kashgar, in Eastern Turkestan, are under construction. These two stations are typical examples showing the difficulties of transportation. Urumsti is 1,500 miles from the nearest railway, and Kashgar nearly 3,000 miles, the only means of transport being by camel. The country in 1921 was in a very unsettled state, and safe transport to these two cities was not possible, but in spite of this it is expected that the two stations will be completed towards the end of 1922.

The Chinese National Wireless Telegraph Company, a joint concern of the Chinese Government and Marconi's Wireless Telegraph Company of London, has made considerable progress, but here again one must remember the difficulties to be encountered. Most of the year has been taken up with consolidating the company's position, and explaining the possibilities to the Chinese authorities and business men.

A factory has been built at Shanghai, and machinery is now being installed; it should be ready to manufacture wireless apparatus in the course of the next few months.

The National Research and Testing Laboratory, instituted by the Board of Communications is nearing completion, and a monthly periodical has been started by the students connected with radiotelegraphy.

The six students sent to the Marconi College, at Chelmsford, by the Board of Communications have now returned to China, after passing through a two years' course of instruction. It is expected that they will be a great help in the development of wireless in their own country. The four students sent to the same College by the Board of Navy are also on their way back to China. It is intended that they shall deal with coast and ship radiotelegraphy.

The Wireless Telephone Signal Corps, formed by the Board of War in 1919, is now an established service in the Chinese Army with a complement of 400 officers and men; at the present moment there are 50 Field Wireless Telephone Sets in use in the various armies, from Manchuria to Honan. The fact that all these sets are worked and maintained without any foreign supervision, would go to prove that the Chinese really are interested, and wish to go ahead with radiotelegraphy.

New stations under consideration are to be erected at Harbin, Peking, Canton, and a large transpacific station at Shanghai. These stations will come under the control of the Board of Communications.

Quite a number of people look upon radiotelegraphy as being too new a science for the Chinese, but if it is remembered that landline telegraphy and telephony are both established services in China, the telegraph service being quite as reliable, and perhaps better than that in some western countries, the writer can see no reason why a radiotelegraph service cannot be established and operated in a successful and efficient manner, so as to become a financial asset to the Government.

F. E. Robinson.

FRANCE.

SINCE the beginning of the year the radio activities in France have been concentrated almost entirely on the realisation of the super-powerful Paris Radio Centre which is being erected on the site of the former estate of Sainte Assise, some forty kilometres south-east of the capital.

This installation will comprise three transmitting plants, one of which will be used for inter-continental communications, another for continental traffic, and the third to perform the services with London and Madrid.

The inter-continental station will be fitted with two 500 kW and two 250 kW Latour—S.F.R. high-frequency alternators arranged for independent or combined working. The direct current motors driving these high-frequency alternators will normally be fed off the power supply transformer groups, but in case of failure of the latter three auxiliary generators, each driven by a 1,800 horse-power Diesel engine, are provided. The antenna is of the "**T**" type, and is made up of twenty parallel conductors supported by sixteen steel towers of the lattice type, each having a height of 250 metres (approximately 800 feet) covering an area of nearly one million square metres. Each tower will rest on a concrete block having a volume of 50 cubic metres, and weighing about 120 tons. The staying of each tower will be done by 28 steel ropes of unequal lengths, the largest being capable of resisting a pull of 106 tons. The author's " balanced multiple-earth " system will be used in this installation, and will be made up entirely of copper plates and conductors, which will spread over an area approximating two million square metres. A total length of 175 kilometres of wire will be used up for this station only. For multiplex working, each half of the antenna will work independently, and Bethenod's compensating system will be used to overcome the mutual reaction between the two halves. Signalling is carried out by removing the normal short-circuit of the alternator. This method is particularly suitable, as it considerably reduces the " spacing " power consumption of the machine. The alternator speed is maintained constant by an extremely sensitive regulator by means of which the wavelength variation does not exceed 10 metres when transmitting on a wavelength of 10,000 metres. This slight variation of wavelength is hardly perceptible at the receiving station, even with very sensitive and selective apparatus. With a view to adjusting the alternator constants to those of the antenna, which latter can only be calculated approximately, the alternators are inductively coupled to the antenna through a high-frequency transformer of variable ratio so that it is possible to work the alternators under optimum conditions. By parallelling the four alternators of this station, it will be possible to put 1,500 kW into the antenna when working simplex.

The continental station will be fitted with four 25 kW Latour—S.F.R. high-frequency alternators which may also be coupled in parallel if required. These alternators may be regulated so as to produce frequencies comprised between 26,000 and 32,400 cycles per second, without exceeding a peripheral speed of 150 metres per second. The antenna of this station is of the double umbrella type, and will be supported by a single lattice tower having a height equal to those of the inter-continental station. As in the latter station, arrangements are provided for the independent utilisation of either portion of the antenna for multiplex working.

The third transmitting plant has been working satisfactorily with London and Madrid for some time. This station differs from the two previously described inasmuch as it uses three-electrode valve generators instead of high-frequency alternators. Its antenna is supported by a single tower 100 metres high.

All signalling will actually be carried out in Paris, and a seven-pair cable linking the plant with the Radio-France Syndicate's head offices in Paris will handle all the signalling currents.

It is estimated that the three transmitting stations which will normally use automatic transmission will be capable of handling 24,000 words of traffic per hour.

The receiving centre is situated at Villecresnes, in the department of Seine-et-Oise, some twenty kilometres from Paris. It is characterised by a symmetrical arrangement of a number of unattended receiving stations, the whole of which presents the aspect of a series of small watch-towers. Each of these stations will be allotted to reception from a particular station, and will include a small indoor loop antenna orientated in a fixed direction. Several stages of high and low frequency amplification will permit of the incoming signals being relayed on to Paris where they will be recorded automatically.

The end of the year will see the completion of this installation, which will provide France with an adequate and independent means of communication with every country in the world.

MARIUS LATOUR.

GERMANY.

IN the construction of long distance radio stations an efficiency of 72 per cent. has been attained by appropriate connections of the alternator and frequency doubling circuits when a fourfold step-up of frequency is used. The methods of multiplying the frequency without intermediate steps have been much improved, and are now in practical operation. When a high-frequency alternator of 6,000 cycles is employed an overall efficiency of 35 per cent. is attained when the frequency step-up is 5 to 1, and 30 per cent. when it is 13 to 1. The speed regulation of the alternator has attained an accuracy of 1 per cent., which is sufficient for all practical purposes even when using a double heterodyne and note tuning at the receiver.

For the speed regulation the current generated by the high-frequency alternator affects the plate circuits of two thermionic valves connected to a tuned condenser circuit. Relays in the anode circuits are connected to the choking coil in circuit with the driving motor.

The Nauen station which has only recently been enlarged does not even now meet the demands upon it, so that its size is being once more increased. Seven new towers, 210 metres high, will be erected in an ellipse round the station at a distance of about 500 metres from the present 250 metre towers. By this means the geometric mean height of the antenna will be raised from 130 metres to about 190 metres. This new arrangement utilises the highest towers more effectively because at least three wires extend from each tower in three different directions. The antenna is built up of triangular shaped sections so arranged that each part can be lowered independently. All the sections can be connected in parallel and then give a capacity of 90,000 centimetres. This arrangement is to be employed when atmospheric conditions are unfavourable. For ordinary use the antenna is divided into three or four separate antennæ, each of which can be connected to a separate transmitter. The two largest sections of the antenna are each connected with a long wave 400 kW transmitter, both alternators having nearly the same wavelength (12,600 metres and 13,000 metres respectively), differing only sufficiently to enable them to be distinguished at the receiver. The smaller sections are connected to short wave transmitters. Although each antenna section is close to the others it has been found possible to electrically separate them sufficiently to enable them to be operated quite independently.

Further progress will be made at this station by improving the earth connections. After a number of experiments with model antennæ one twentieth of the size of the actual antenna, an earth resistance of less than one-tenth of an ohm has been attained. If Abraham's theory with regard

to the proportions of model antennæ holds good, an almost immeasurably small earth resistance may be expected for the new antenna.

Abraham's theory with regard to model antennæ states that if all the dimensions of the antenna are equally enlarged, the earth resistance decreases proportionally to the increase in size assuming that the conditions of the ground connections are such as to take the earth current as far as possible outside the area covered by the antennæ. More than half of the lines of force from the antenna enter the ground outside the area of the antenna, when, as in this case, the antenna has a radius of 500 metres, and is 200 metres in height. Hence the mean flux line enters the ground on the border of the projected area of the antenna. The earth connections must therefore be made at this place. About 30 leads are taken from the centre of the antenna and led down to the ground connections which are spread over a space equal to the area of the antenna plus its height. Each one of these earth connections carries only the current corresponding to the number of lines of force which enter the ground in the area covered by that earth connection.

The present resistance of the aerial circuit is 2·3 ohms, but by the above improvements it may be possible to reduce this to 0·7 or 0·8 ohm if the radiation resistance is 0·3 ohm, and the loading coil resistance 0·3 to 0·4 ohm at a wavelength of 12,600 metres. As the aerial will be designed to operate at any voltage up to 120,000 volts, its transmission factor will then be 180,000 metre-amperes. Using such a transmitter energy Nauen will, during the next few years, be able to communicate with Argentina. With this in view a high-power station is now being built near Buenos Aires using a 400 kW high-frequency alternator. This station will have six towers 210 metres high. In order to increase the output of thermionic valve transmitters, higher supply voltages are being used. Large valves of 4 and 5 kW have proved successful. With the early patterns of these large valve transmitters the sound at the receiver was not steady, but this has now been improved. The number of valve transmitting stations used for the Postal Telegraph Service has been increased during the past year, and amongst others a service between London and Berlin has been opened. Many successful experiments have been carried out with wireless telephony for communication between Berlin and other large stations outside Germany. Experiments to test the range of transmission have shown that telephony from a 10 kW transmitter at Königswusterhausen, near Berlin, could be heard 3,000 kilometres from the station, and a small high-frequency alternator transmitter at Nauen (type 150 MK) up to 4,500 kilometres range.

Several new high-frequency wire telephone installations have been made during the past year, amongst these services between Munich and Frankfurt a/M and between Berlin and Hamburg may be mentioned. These permit of four simultaneous conversations between the points in question. It is proposed to lay cables between the large towns in order to overcome the disadvantages attached to the use of overhead lines.

DR. ING. A. MEISSNER.

GREAT BRITAIN.

THE period of intensive radio research for war purposes being ended, the year under survey may be regarded as practically normal and typical of what we may expect in the post-war period. The war has, however, left us a valuable legacy in that the Government is now more firmly convinced of the Imperial value of wireless communication, and of the necessity of keeping wireless research fully alive in all the three Services. This conviction found expression in the formation of the Imperial Wireless Telegraphy Committee, and the Radio Research Board somewhat more than a year ago.

The outstanding event of the year is undoubtedly the opening of the Leafield station, which is to be the first link in the Imperial Wireless Chain. The Leafield station was begun by the Marconi Company in 1913, and taken over incomplete, by the Post Office when the Marconi contract was cancelled. The task of completing it was put in hand in 1919, with the result that the first messages were sent out on August 18th, 1921, being clearly received by stations as far distant as Aden, Newfoundland, and Jamaica. The transmitter is an Elwell-Poulsen Arc, and is intended to have a day and night range of 2,000 miles, and to communicate comfortably with the station of Abu Zabal, near Cairo. The Leafield station is the first high-power station to be designed by the British Post Office.

During the year much progress has been made in the testing of the reliability of various direction-finding sets. From these experiments we may take it as definitely proved that for long ranges atmospheric conditions may produce errors in bearing much larger than the possible errors of observation. It is thus clear that work of this nature is going to give us valuable information regarding atmospheric ionization, rather than to lead to the evolution of a very accurate position finder. In this connection we might notice particularly the strikingly original work of Eckersley on the effect of the Heaviside Layer on the apparent direction of electromagnetic waves. Eckersley assumes that the reason a loop can receive signals from a transmitting station when the plane of the loop is at right angles to the line joining the two stations, is that there is a ray of sufficient intensity reflected from the Heaviside Layer in a vertical plane. His experiments are interpreted as proving that there is definitely a ray reflected by night and not by day, and that it is of the right order of magnitude to produce the effects observed. The point of view is undoubtedly suggestive, and in the near future we may expect important results from experiments designed to test Eckersley's theory in other ways.

The problem of atmospherics is still with us, and although the definite recognition of the identity of most strays with the electromagnetic pulses generated by lightning flashes helps us somewhat in speculating as to the temporal variation of the electric vector of the former, progress at present appears only possible in attempts to increase the ratio of signal to stray. Complete elimination would appear to be, in the present state of our knowledge, a singularly elusive performance.

In this connection it may be mentioned that for an atmospheric pulse of given duration there is a definite receiver frequency for which, *ceteris paribus*, the rectified quantity of electricity passing through the telephones will be a maximum. This follows from the solution of the differential equation expressing the action of an aperiodic pulse on an ordinary antenna system. From this one may deduce the fact that up to a wavelength of 18,000 to 20,000 metres the effect of an atmospheric will increase with increase of wavelength of the receiver. Recognising this, the question of the optimum wavelength for wireless transmission has again been raised by L. B. Turner, who suggests that for ranges such as 4,000 kilometres much shorter waves should be used than are usually adopted, provided the necessary power can be developed at such wavelengths.

In the development of receiving triodes no particularly important advance has been made. In the case of transmitting power triodes makers are gradually realising the usefulness of silica as opposed to glass. Since the melting point of silica is high, the distance between the anode and the silica container need not be large, and thus a small tube is the result. Also the insulating properties of silica are all that can be desired. It thus looks as if we shall soon witness the production of a power triode as satisfactory for the work of transmission as is the small triode for receiving purposes.

E. V. Appleton, M.A., M.Sc.

HOLLAND.

IN the 1920 issue of this YEAR-BOOK mention was made of the linking up by means of wireless telegraphy of Holland with her East Indian Colonies, and some particulars were given about the Indian transmitting station. Since then a large new arc transmitter is being constructed under the direction of Dr. de Groot which is expected to deliver 1,200 to 1,800 kilowatts to the antenna. The necessary primary D.C. input to this arc is estimated to be 2,400 to 3,600 kilowatts. The motor generators have, however, not yet been installed, so that the traffic from India to Holland is at the moment still carried on by means of the smaller apparatus.

The receiving station at this end of the link has been working already for some time, but the transmitting station in Holland which is also being built by the Telefunken Company, has at the moment of writing (October, 1921) not yet been completed. The results of the first tests, which it is hoped can be carried out before long, are, it will be obvious, looked forward to with much interest.

Apart from the work done in connection with the East Indian scheme, no outstanding technical wireless events can be reported to have taken place in Holland during the last year. Mention may be made, however, of a powerful wireless telephony transmitting plant which was installed by the "Nederlandsche Seintoestellen Fabriek" in the Amsterdam Bank, and which is used for the daily transmission of financial news. Further, several types of wireless apparatus are manufactured in Holland by various firms mainly for the use of amateurs, among which the "Nederlandsche Radio-Industrie" is well known in England through its weekly wireless telephone concerts.

We now turn to the purely scientific progress made recently in Holland in connection with the many physical and mathematical problems which are at the base of all industrial applications.

In the Dutch scientific journal *Physica* (Founded April, 1921) an interesting communication appeared by Elias, Julius and Reiseger, about the radiometric measurement of low gas pressures, which kind of measurements, after the advent of triodes, now belong to the domain of wireless. It is there found theoretically and confirmed experimentally that the reflection of a pair of small mica plates suspended by means of a quartz fibre, while a beam of light of constant intensity fell on one of these plates, was, for a certain range of gas pressures, exactly proportional to these pressures.

In a series of lectures given at the Leiden University (1920) Professor Lorentz treated the theory of free triode vibrations. Up to that time, in all theoretical investigations of this kind the triode, characteristics were mathematically considered to be straight lines resulting in a considerable simplification of the analysis. In these lectures, however, an oscillation theory was worked out on the basis of non-linear characteristics, and in this way only it is possible to arrive mathematically at the steady or maximum value of the oscillation amplitudes.

Subsequently, similar investigations were taken up by the present writer, and in a paper read before the "Nederlandsch Radio Genootschap" (Dutch Radio Institute),* it is shown how far a general form of the characteristic triode surfaces the amplitude to which free and forced vibrations build up can be calculated. It is further shown that for a small impressed E.M.F. the system can, under certain circumstances, be treated as having a reduced natural damping, while for a big impressed E.M.F. the resulting amplitudes are proportional to the cube root of this E.M.F., the system thus acting as a limiter.

In another joint paper with E. V. Appleton,† "On the Form of Free

* *Tydschrift van het Nederlandsch Radio Genootschap* 1, pp. 3-31, October, 1920; also *Radio Review*, 1, pp. 701-710, November, and pp. 754-762, December, 1920.
† *Philosophical Magazine* 42, pp. 201-220, August, 1921.

Triode vibrations," the wave form of the anode and grid currents are discussed in detail. When the frequency is very low (*e.g.*, 16 per sec.), some oscillograms show a distinct variation in mean temperature of the filament, the latter being cooled, due to the loss of energy accompanying the emission of electrons. This effect is in ordinary receiving triodes not counterbalanced by the Joulean heating effect of the anode current when it returns to the filament again. The secondary emission by the anode is further found to be an important factor in determining the current wave form ; *e.g.*, the oscillating grid current can be split up in two parts, one part being constituted by the primary electrons from the filament, while the other part is made up of secondary electrons coming from the anode, the latter part often being much the greater of the two during a certain part of the cycle.

In another joint paper with E. V. Appleton*, the conditions for the starting and stopping of triode oscillations is investigated theoretically and experimentally. It is found that these conditions are in general not identical, and thus a kind of oscillation hysteresis is found to occur at the bottom part and top part of the ordinary anode current-grid potential characteristic. The non-linear theory here again gives the explanation. It appeared that the *seventh* differential coefficient of the "oscillation characteristic" has to be taken into account in order to explain the experimental results satisfactorily.

Finally, another application of the non-linear treatment of triode vibrations was given by the writer to the phenomena† occurring when a triode oscillator is coupled strongly to a secondary oscillatory circuit, which phenomena are called in Germany "ziehen." Under circumstances it is found that the oscillations, when one of the electrical parameters is varied continuously, jump discontinuously from one frequency to another. The theory shows that here again a kind of oscillation hysteresis presents itself, and that it is necessary to distinguish the oscillations as stable, metastable and unstable ones.

There is no doubt that progress in elucidating the many interesting properties of free and forced triode vibrations can only be made on the basis of a non-linear theory. The fact, for example, that forced vibrations can either suppress or start the free vibrations of a triode oscillator can only be explained when the interaction of simultaneous vibrations is taken into account, for in such a case a linear theory, in which the principal of superposition is valid, would be inadequate.

BALTH. VAN DER POL, JUN., D.Sc.

ITALY.

SUBSTANTIAL progress in the development of radiotelegraphic activities in Italy has been made during the past twelve months.

The principal points of progression will be found set out below, and it only remains for us to observe that we should have had still further advancement to report had it not been for the following reasons :—

(1) The strained economic situation for which the war is responsible has prevented the investment of the capital required for extensive development of the latest improvements in this sphere of industry.

(2) We still lack a strong national industrial organisation in the radiotelegraphic field, capable of supplementing the work of the State, on the same lines as in other countries.

(3) The rate of progress has necessarily been limited by the time taken up in legislation, but it is satisfactory to note how much has been achieved in spite of this fact.

* *Philosophical Magazine* 43, pp 177-193, January 1922.

† *Tydschrift van het Nederlandsch Radio Genootschap.*

Manufacture of Apparatus.

At the Navy Works at Spezzia, activities mainly continue to be concentrated on the production of arc sets, but there has recently been a decided tendency to devote more attention to Marconi valve instruments.

At the Army Works at Rome, the material employed during the war has been overhauled, and a start has been made with the construction of C.W. apparatus, for military purposes, in connection with both telegraphy and telephony.

At the Marconi Works at Genoa (the only industrial wireless works erected during the war) considerable attention has been given to the production of valve sets in addition to the ordinary rotary spark apparatus so largely employed in the Mercantile Marine.

In the same factory there have also been produced a number of adaptor sets following the designs originated by the English Marconi Company. These devices admit of the rectification of the alternating feed current of the Marconi rotary spark sets, and are so arranged that the same generator operates both the valve and spark installations. Very successful results have been obtained on board H.M.S. "Trinacria" by the employment of apparatus of this description, with a capacity of 1.5 kilowatts.

During a demonstration cruise carried out by this vessel, it was found possible to communicate regularly with the Rome station from any part of the Mediterranean Sea as well as from the western coasts of Europe and Africa. It has been decided, as the result of these experiments, to fit these sets on the larger vessels of the Mercantile Marine and to equip the coast stations of the Italian Navy, located at Genoa and Adalia (Asia Minor), with similar apparatus. A Select Committee is also considering the question of their adoption for the use by the Army.

The Wireless Institute of Military Engineers in Rome is continuing investigations into the efficiency of the different types of portable and fixed apparatus, and despite the advantages presented by the rotary and quenched spark systems for field station work, the possibilities of valves have come in for their full share of attention. The above institute has also carried out a series of investigations into the technical and scientific effect of electric oscillations, and has continued the good work of organising the staff destined to supervise the activities of army wireless stations.

The Wireless Telegraphic Naval Institute in Leghorn has continued the work of improving and completing its research laboratory. Important scientific results in the analysis of thermionic valve working have been obtained, and much progress has been made in the methods of testing wireless apparatus of Italian and foreign manufacture.

The Ministry of Marine have extended their long distance wireless services (fitted in record time during the war) connecting Rome with the Colonial Stations and Italy with the principal European and American radio centres.

In view of recent developments in long distance wireless the Ministry of Marine has decided to replace the present Marconi station at Coltano (near Pisa), which has proved so successful during the last ten years, by a new and powerful station developing 200 kilowatts. This new station will be supplied with a Marconi valve receiving apparatus (duplex system) and with a high-frequency alternator transmitter supplied also by the Marconi Company.

The fitting of this new station has been decided after exhaustive practical tests made with the arc and alternator system. This comparison took place in 1918 before an official delegate committee of the Italian Navy during their visit to the British station at Carnarvon, when correspondence was exchanged between Carnarvon and American stations having different systems. This new station at Coltano, has now, under Royal Decree, been renamed "Marconi"

and will carry out a direct and regular public service between Italy and America.

The practical use of wireless telephony for public service, made a start in Italy during 1921. After the interesting trials made in the presence of the Italian Press, between the Marconi station at Chelmsford (England) and the Rome station, the utilisation of this new means of communication has been extended in Italy, not only between ships at sea, but also between the Continent, the Islands, and the Italian Colonies.

The Ministry of Posts and Telegraphs, with the technical co-operation of the Ministry of Marine, has opened a radiotelephonic service between Rome and the Island of Sardinia.

The direction finder was born in Italy, and its modern developments, based on the Artom-Bellini-Tosi Patents, of priceless service to the Allies during the war, reached Italy last year. The installation of these devices is extending, not only in the Italian Navy, but also in the Mercantile Marine.

Senatore Marconi carried out, during 1921, along the European coasts, on board his yacht " Elettra," a series of highly important experiments with a new receiver of exceptional sensitiveness and selectiveness. By such apparatus joined to a square frame of about one metre wide, fitted inside a cabin on board, Senatore Marconi demonstrated to the highest authorities of Italy, Spain, and Portugal, the possibility of receiving messages regularly from America or from any other European station, under the worst atmospheric conditions. The results obtained on the " Elettra" by this new receiver, in respect of which much credit must be given to Monsieur G. R. Mathieu, have proved its absolute superiority to all the receivers at present in use.

The Italian Marconi Company (Società Italiana peri servizi radiotelegrafici), of which Senatore Marconi is the chairman, was formed in July, 1921, and has started the installation of a wired wireless system of wireless telephony, in order to join up the hydroelectric power stations with the large centres of distribution of electrical energy.

JAPAN.

THE technical progress of radio in Japan during last year relates essentially to the following items :—

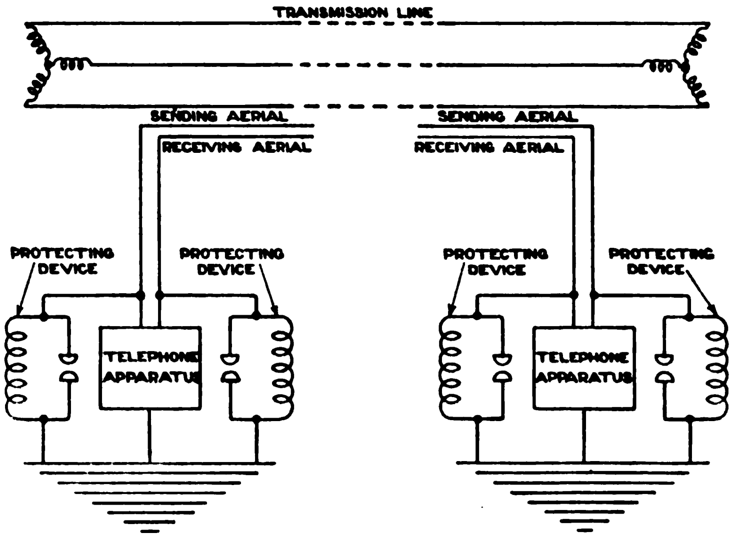
(1) High Frequency Telephony over Power Transmission Lines.
(2) Radiotelephony for Short Distance Communication.
(3) Opening of a High Power Radiotelegraphic Station.

As to the application of high-frequency telephony over power transmission lines, the field experiment at the Kinugawa Hydro-Electric Company, which was referred to in the last YEAR-BOOK by myself, popularised interest in this art among electric power engineers in this country. Cabinet sets of new design for commercial use were manufactured, and with them have been executed further field tests on the transmission lines of the Ujigawa Electric Company. The skeleton diagram of the arrangement is seen in the accompanying figure, and was patented in November, 1921, in this country.

The recent development of power triodes in this country has induced us to carry out radiotelephonic experiments over moderate distances. The test between Awomori and Hakodate, which was also referred to in the last YEAR-BOOK, is one of them. Though the results of the test have been quite satisfactory, using only a small power tube for the transmitter, the spark radiotelegraphic communication, which has been handled incessantly between the same stations, made the continuous radiotelephonic connection impossible. The steps are being taken to make possible the simultaneous working of radiotelegraphic and radiotelephonic channels, the spark system being replaced by a continuous wave one. Two other places which require radio connection

are Japan proper and Korea. Their shortest distance over sea is about 120 nautical miles. This will be experimented with in the near future.

I think, under the present condition of technical advancement, it is very difficult for a person without electrical knowledge to easily handle even the simplest radiotelephonic apparatus. It must therefore be remembered that,



for wide use of radiotelephony, the connection of wired and wireless telephones is of vital importance, and this art must make progress in parallel with that of radiotelephony itself.

As a record of transpacific communication a high power radiotelegraphic station called "Iwaki" was opened in March, 1921. The transmitting and the receiving houses are about 20 miles apart, and some 170 miles north of the City of Tokyo. The transmitter consists of a 400 kW arc converter and a 400 kW 20,000 cycle alternator, either of which may be spare. The aerial is of the umbrella type, and is supported by one main tower 200 metres high and 18 wooden poles 60 metres high, surrounding the former as the centre of a circle. The centre main tower is of the self-supported type, and is a reinforced concrete structure weighing about 11,000 tons. The total construction cost of the whole station, including both transmitting and receiving sections, amounted to about 1,000,000 yen. Though, at present, this station is limited to the duplex daily communications with the Kahuku and Koko Head stations of the Radio Corporation of America, in Hawaii, it is intended to extend it to direct traffic with European stations, if the station capacity is sufficient.

EITARO YOKOYAMA.
Superintendent of Radio Section, Electrotechnical Labratory, Japan.

NEW ZEALAND.

THE only recent developments in New Zealand are the fitting up of merchant ships and the passing of an Act authorising the Postmaster-General to issue licenses for experimental stations.

There are four coast stations in New Zealand owned and operated by the Post and Telegraph Department, and a considerable number of merchant

ship stations owned and operated by the Almalgamated Wireless (Australasia), Limited, under the same co-operative arrangements as exist in Australia, whereby the principal shipowners are shareholders in the Company and have their own representative on its board.

The Government station at Awarua has done much important work in experimental long distance reception, definitely establishing the possibility of receiving direct from high power stations in Europe.

Apart from training schools, there are no other activities in New Zealand, but it is anticipated that a corresponding station will be erected as soon as arrangements are completed for wireless communication between England and Australia.

E. T. FISK.

NORWAY.

NO technical development of any interest has taken place in this country during 1921. Slight improvements have been made in existing land radio stations, but no additional stations have been erected. In the Norwegian Mercantile Marine progress has been made in the fitting of ships with wireless installations and by the end of 1921 about 475 vessels will be so equipped. C.W. apparatus has been introduced on the larger passenger vessels and considerable interest is being evinced in the development and application of D.F. apparatus to marine work.

The general laws and regulations with regard to the control and use of wireless telegraph installations have remained unchanged, as also have the restrictions still imposed upon amateur and experimental wireless work in this country.

Commander B. L. GOTTWALDT.

SPAIN.

THERE has been little or nothing to report about the progress of wireless in Spain during the first half of the year 1921. Lately, however, conditions have changed and some activity has been shown in various quarters.

The Navy Department have decided to modernise all the wireless equipments of the Spanish Navy. All the vessels having spark sets will be provided with valve installations. The development of this scheme has already begun.

A Bill was passed providing the necessary resources for the establishment of the Spanish Naval Aviation Service and the provision of wireless equipment for the Naval Aircraft; the first hydroplane has already been fitted with a Marconi type "AD 2" set and a direction finder, and the fitting of further machines will be carried out very shortly. Furthermore, the fitting of the submarines and their bases with the latest type of valve equipments is now under consideration at the corresponding Naval depôts.

The Government has been compelled to start military operations on a wide scale in Morocco, owing to the last Moorish revolt, and in order to improve the efficiency of the Army, the number of wireless field sets in use has been largely increased. Most, if not all, of the sets have been supplied by the Compañia Nacional de Telegrafia sin Hilos, the licensees of the Marconi patents in Spain. The success obtained with the portable sets that are now working throughout the different branches of the Army has led the Government to call for a "Concourse," in order to determinate the types that will be adopted as standard for the Army. The Aviation Services have been

pushed forward, and a number of flying machines have already been equipped with wireless sets. Permanent stations at Madrid (Cuatro Vientos), Sevilla, Cartagena, and other places, are in course of erection and will be employed to communicate with the flying machines.

The fitting of the wireless telephone and telegraph stations at Valencia and Palma de Mallorca is proceeding satisfactorily, and is very near to completion. Each station will consist of a 1½ kW Marconi Valve "Cabinet" set. Some extensive trials had to be carried out for the selection of the best sites, so as to avoid screening effects and local influences from electric power and tramway lines.

In order to cope with the present requirements of the International Public Wireless Service, the Compañia Nacional de Telegrafia sin Hilos is now developing a scheme embodying important improvements in the working capacity of the Aranjuez (Madrid) and Prat de Llobregat (Barcelona) stations. Each of them has already been provided with a 15 kW valve transmitter of the latest Marconi pattern. Both sets are already working, and the results obtained are very satisfactory. Special receiving stations have been installed at Barcelona and Madrid; the latter is linked by landline to the Aranjuez transmitting station, and a similar scheme for the Prat de Llobregat-Barcelona stations is now under consideration. Use is made of the latest devices in regard to frame aerials and valve receivers, and some special arrangements had to be provided in order to balance out the interference from nearby stations. The work of cutting out jamming has been particularly troublesome at the Madrid station on account of the proximity of the high power Army station of Carabanchel. Owing to the increasing volume of traffic with the United Kingdom and Germany, and the necessity to develop the traffic with France, it has become imperative to employ automatic transmission for the Madrid-Aranjuez station. Therefore, in the very near future, the Aranjuez valve transmitter will be operated from Madrid at high speed by means of a Wheatstone Transmitter and Creed Perforators; the received signals will be recorded by a Marconi Patent Undulator.

The year 1921 has been marked by a great depression of the Mercantile Marine business, owing to the abnormal economical conditions prevailing throughout the world. On the other hand, a Royal Decree was issued on February 19th, stating that as the circumstances that made wireless sets compulsory for all ships had disappeared, only ships carrying more than twelve passengers or more than fifty persons aboard need now be provided with a wireless installation. However, in spite of these unfavourable conditions, wireless sets have been fitted on 25 merchant ships during the year, and the substitution of valve and quenched gap sets for the old spark sets as well as the fitting of direction finders on the larger passenger ships is proceeding satisfactorily.

The position of the wireless amateur in Spain has not improved, as the Post Office authorities are still reluctant to grant licenses for private stations. The Post Office, however, is none the less enthusiastic on wireless, as has been well evidenced by the establishment of a School for Radio Engineers, in order to provide the necessary trained men when the developments contemplated by this department have come into being.

UNITED STATES.

THE past year has witnessed a vigorously healthy development of radio communication in America. This has been particularly evident in the expansion of the long distance field. On the Atlantic Coast, in addition to the high power station of the Navy at Annapolis, there are now 200 kilowatt stations for European communication at Tuckerton (New Jersey), New Brunswick (New Jersey), Marion (Massachusetts), and at Port

Jefferson (Long Island). This last station is the well-known New York Radio Central, and will have an ultimate antenna power running into thousands of kilowatts. It will comprise at least twelve unit transmitting stations for transoceanic working, two of which are already completed. All of the preceding stations are operated by the Radio Corporation of America, which also operates the similar stations at San Francisco, California and Hawaii, on the Japanese circuit. In order to provide these and other stations abroad with generators, several dozen 200 kilowatt Alexanderson alternators have been built during the last year and a half.

The longer distance ship services have also been expanded during the year by the erection of a number of coastal stations by the Federal Telegraph Company (Poulsen arc system), Cutting and Washington, Independent Radio Telegraph Company, International Radio Telegraph Company, and the Radio Corporation of America (vacuum tube system). The Belmar (New Jersey) and Chatham (Massachusetts) stations of the last named company are particularly interesting in that they are directly controlled by wire line from New York, thereby expediting traffic.

The Federal Company is establishing a chain of overland stations using the arc system on the West Coast, and the Intercity Radio Company has established overland stations at New York, Cincinnati, Detroit, and Chicago.

The broadcasting of market reports has engaged the attention of the Bureau of Markets of the Department of Agriculture, and radio is being used widely by the Government for this purpose. The Post Office Department is also using radio for communication with the mail planes.

The use of underground antennas for reception has been investigated by Messrs. A. Hoyt Taylor and A. Crossley, of the Navy. It has been found possible by their use to receive through nearby transmitting stations, utilising the directional effect, and thereby also to establish very effective duplex communication.

The transfer of received radio signals over wire lines to suitable central offices in the larger cities, where they may be transcribed and the messages promptly issued, has engaged considerable attention on the part of the Radio Corporation. It has been possible to carry on actual reception in the heart of New York, while the special static-reducing antenna system and its associated receivers were situated many miles away, with wire line connection to the city.

High speed reception has also advanced considerably recently. The Hoxie photographic recorder has been produced by the General Electric Company, and found certain applications. The Radio Corporation has also produced a new form of high speed ink recorder, which is widely used in their receiving stations.

Among recent receiving methods should be mentioned the double heterodyne system for short wave reception, disclosed by E. H. Armstrong.

The use of the sense of taste for reception was investigated by the author and E. T. Dickey, at the suggestion of A. Isbell. It was found possible to receive to an acceptable extent by this curious method.

Vacuum tube development during the year has been in the direction of standardisation of detector and amplifier receiving tubes, and the low and moderate power transmitting tubes. One exception to this has been the development of the pliodynatron, a special form of four-electrode tube, as an unusually effective detector and amplifier.

The use of radio direction finding has been rapidly expanded by the establishment by the Navy of a chain of radio compass stations which give ship transmitters their position by means of a process of triangulation. The Bureau of Lighthouses has also established a number of unmanned radio beacons, which enable ships equipped with direction finders to determine

their location in a fog by receiving and identifying the signals from several such beacons.

The special aspects of direction finding have been investigated by C. Kinsley, as to changes in the apparent direction of transmitting stations, and by L. W. Austin, on the quantitative relations existing for coil transmitters and receivers.

Radiotelephony has been developed along lines of multiplex operation and also in the marine field. Messrs. Ryan, Tolmie, and Bach, have succeeded in transmitting five radiotelephone messages from one antenna simultaneously, on different wavelengths. The American Telephone and Telegraph Company and Western Electric Company have achieved the remarkable feat of transmitting speech from the Catiline Islands in the Pacific Ocean by radio to land, thence by wire across the entire continent, and thence by radio again to the steamship "Gloucester" in the Atlantic Ocean. Speech has also been transmitted from Havana, Cuba, over the submarine telephone cable, and thence by wire and radio to the Catiline Islands.

The introduction of the "wave antenna" for long distance reception by Messrs. H. Beverage and C. Rice has led to a marked improvement in the reception of transoceanic signals through atmospheric disturbances. This long antenna with its associated circuits seems to be highly directional as well. In this connection an interesting practical study of the relative merits of several systems for the reduction of static effects in reception has been carried out by L. W. Austin, and the results published.

During the last year, meetings of the Preliminary International Conference on Electrical Communications were held in Washington. Many of the important and troublesome questions of international radio communication were carefully considered, and it is believed that some progress was made toward satisfactory solutions of these difficulties. The results of this work will be laid before the final International Conference in 1922.

ALFRED N. GOLDSMITH, B.S., Ph.D.
(*Editor of "Proceedings of the Institute of Radio Engineers."*)

THE RECORDING OF WIRELESS SIGNALS.

By Prof. HENRI ABRAHAM and EUGÈNE BLOCH.

INTRODUCTION.

THE development of methods of reception of wireless signals has followed quite different lines from ordinary telegraphy. In the latter the transmitted signals were reproduced, first of all, on the tape of a Morse instrument, by degrees the method of recording was perfected and there appeared the Wheatstone apparatus, the apparatus due to Hughes, the apparatus of Baudot, and others besides, which ultimately produced direct on a piece of paper the characters written in the telegram, just like a typewritten copy.

In the case of wireless telegraphy, however, there were three distinct stages of development.

In the first instance, when the coherer was used to detect the waves, the variations in resistance of the receiver were employed to actuate a relay and to record the signals on a Morse tape. The idea in this case was to imitate the methods used in ordinary telegraphy, and no thought was given to the question of the reception of wireless without recording, or, at least, without the employment of a strong electromagnet, as in telegraphic reception with the sounder.

This state of affairs was quickly changed. The employment at the transmitting station of low-frequency spark trains succeeding each other by small fractions of a second during the transmission of each signal, combined with the use of detectors which were practically instantaneous in action (such as galena, and electrolytic or magnetic detectors), made possible the use of the telephone for reception. The replacement of the low-frequency sparks by sparks of musical frequency added so considerably to the efficiency of the telephones that their use became universal and for a long while the recording of signals was abandoned in practical work. Apart from its extreme simplicity, the telephone took advantage also of the extreme sensitivity of the ear, and of its ability to distinguish easily between the musical signals transmitted on a definite note, and noises due to "atmospherics," which, in the telephones, took the form of sudden clicks devoid of any musical characteristic. Reception by sound has therefore become the rule, and there has been no serious reason for discarding it, while the traffic of the wireless stations was not very heavy, and one could be satisfied with a speed of transmission not exceeding one thousand or twelve hundred words an hour.

Nevertheless, since this period, which lasted until towards 1914, very exhaustive experiments have been made in methods of photographic recording of signals by various experimenters in the interests of science. It was by this means, for example, that it was possible to determine the speed of propagation of wireless waves around the earth by recording the signals transmitted by two intercommunicating wireless stations, simultaneously with the vibration of a standard tuning fork. In particular, a series of experiments were conducted between Paris and Washington in 1913-14,* and Fig. 1 is a reproduction of a photographic print obtained at Washington in

* H. Abraham, A. Dufour and G. Ferrié, "Sur une Méthode de Mesure Directe de la Durée de Propagation des ondes de T.S.F. à la surface de la Terre" (*Comptes Rendus de l'Academie des Sciences*, Vol. 159, p. 38, 1914).

See also "Au Sujet de la Détermination de la Différence de Longitude entre les Observatoires de Paris et de Washington" (*Comptes Rendus de l'Academie des Sciences*, Vol. 162, p. 899, 1916).

the reception of the low frequency spark signals ("étincelle ronflée"), which were transmitted by the Eiffel Tower at this period.

The third period of development began about 1913, with the discovery and utilisation of the amplifying properties of the "audions" or three-electrode valves, invented in 1906 by Lee de Forest. These valves having the property of amplifying received signals to a degree hitherto unknown,* it became possible to have sufficient energy at the receiver to actuate mechanical recording instruments of more robust a nature than the photographic galvanometers.

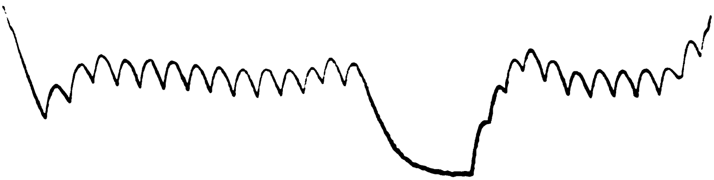


Fig. 1.

Record, taken at Washington, of a transmission from the Eiffel Tower (ronflée), January 13th, 1914.

At the same time that the introduction of these amplifiers produced a veritable revolution in the reception of wireless telegraphy, the transmitting stations, too, were undergoing important changes. In place of the spark transmitters continuous wave transmitters were being gradually introduced, and the signals emitted by them were more readily distinguishable from atmospherics and other interference. The power of the transmitters of the large stations was also much increased so that the seriousness of interference in long distance communication was lessened. But the increase in the cost of construction of the extra high power stations and the cost of maintenance has produced another difficulty. It is necessary to increase their efficiency by exploiting to the utmost their capacity for transmission, or only a ruinous business will result.

In place of hand operation, which cannot exceed 20 words per minute, automatic transmitters are employed which operate up to a speed of 50, 100 or even 200 words a minute. But with this speed of transmission, direct reception by ear by means of the telephone is not possible; the ear can no longer follow the signals, and it has become necessary to revert to methods of recording.

Photographic Methods.

The first practical use of photographic methods in wireless telegraphy is about contemporary with the scientific movement which accompanied the development of time signal services, marked by the holding at Paris, in 1912, of an International Conference, and by the foundation of the Bureau International de l'Heure.

Apart from the commercial reception of messages, a new problem had presented itself. It was the question of determining, with the maximum accuracy possible, the moment of arrival of a wireless signal, for the purpose of the checking of clocks or the determination of differences in longitude; it was, of course, apparent that a photographic record would give more accuracy than would be possible in reception by ear.

* The "amplifying tubes" did not come into practical use until it had been possible to construct them with high vacuum (less than 1/1,000,000 of an atmosphere) as in the construction of X-ray tubes. This was accomplished in 1914 by I. Langmuir, in the United States, and by H. Abraham and G. Biguet, in France. The type developed by the latter was known under the name of "Lampe de la Télégraphie Militaire (T.M.)," or "French Valve," and was reproduced in large numbers during the war; the allied armies employed nearly a million of them.

The following methods were suggested and employed with success * :— String electrometer with single metallic quartz fibre (Wulf), a string galvanometer (Lucas), or the moving coil galvanometer (Abraham). These were not the only experiments, however, and in particular, about this time, there passed through our hands some excellent prints obtained by engineers of the Marconi Company.

A little later we obtained, across the Atlantic, during the winter of 1913-1914, direct records, without amplification, of the Eiffel Tower signals, received at the Arlington Station in the United States, the object being the measurement of the speed of propagation of waves on the surface of the earth, and the determination of the difference in longitude between the Observatories of Paris and Washington.

We employed a moving coil galvanometer placed in the field of an electromagnet. The coil, of very fine wire, was extremely narrow, and was mounted with its length in line with the suspension wire. A tenth of a microampere gave a movement of about one centimetre, and the rapidity with which the coil returned to zero was of the order of the tenth of a second. It was under these circumstances that the print shown in Fig. 1 was obtained, in which the individual reception of successive sparks can be seen, separated by intervals of a twentieth of a second, which corresponds with the old low frequency spark transmissions of Paris. Fig. 2, obtained in the same way, but with a more rapidly acting galvanometer,† shows the simultaneous reception of two telegrams, one from a "musical spark" transmitter, and the other from a "low-frequency" spark. The two transmissions can be easily distinguished, and the low-frequency spark signals are separated from the "musical" signals in the same manner as atmospherics.

The invention of amplifiers has necessitated the reconsideration of the question of photographic recording. With more energy available, less delicate instruments can be employed, giving more rapid action—as, for example, the Blondel oscillographs.

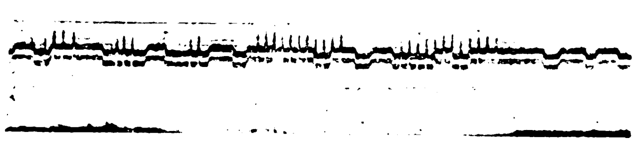


Fig. 2.
Simultaneous photographic reception of two transmissions—one "ronflée" and one musical note.

Mr. Alexanderson, in the United States, set to work from a somewhat different point of view, in proposing the use of a galvanometer tuned to vibrations of high audible frequency (2,000 to 3,000 per second). The apparatus is intended for the reception of continuous wave signals by the beat method. The galvanometer may be described as a "moving-iron" galvanometer. The recording action consists of a little triangle of steel, having the period of vibration already stated, which is brought under the influence of an electromagnet similar to that of a telephone. An ingenious arrangement allows this movable action to control, with amplification, the rotation of a galvanometer mirror. The tuned galvanometer vibrates during the whole time it is excited so that each signal is translated into a broadening of the zero line (Fig. 3).

* Conférence Internationale de l'Heure (1912). Contributions by Messrs. Abraham, Lucas and Wulf. (*Procès verbaux des Séances*, pp. 235, 239 and 243.) See also Turpain (*Journal de Physique*, 1911).

† Unfortunately, this photograph has been taken with too much light, and the print is disfigured by multiple reflections on the two faces of the galvanometer mirror.

The photographic methods which we have just briefly described, have not reached their final stage; they are destined to give still greater service to wireless telegraphy. If they have the disadvantages that chemical products and a dark room have to be employed, they have, nevertheless, the advantage over other methods that they are much more sensitive for the same speed of recording.

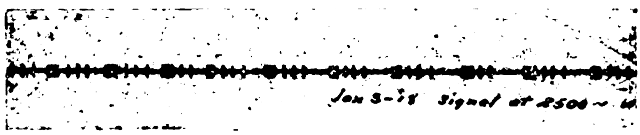


Fig. 3.

Reception of radio signals with an Alexanderson resonance galvanometer.

ACOUSTIC METHODS.

Since good amplifiers have been available it has become possible to receive the most distant transmissions with great intensity, and it has been possible to record on the cylinder of a phonograph the movements of the vibrating diaphragm of the telephone receiver.

In principle, the arrangement is quite simple. The telephone current being amplified so as to produce very powerful sounds the vibrating diaphragm is connected to a sapphire with a cutting edge which traces a groove in the wax cylinder of the phonograph. When once the telegram has been inscribed the apparatus is made to repeat it so that the operator may prepare the transcription.

This method permits of the recording of rapid automatic transmissions which the phonograph afterwards repeats slowly. In this repetition the ear retains its faculty of analysis in spite of the noises produced by the reproduction, so that the operator is able to distinguish quite well between the "timbre" of the signals and the confusion of jamming and atmospherics. But these qualities must be balanced against the disadvantage that is occasioned by the loss of time in double reception and by the necessity of renewal of the wax cylinders without causing interruption of reception, each cylinder serving only for a few minutes, whilst each individual cylinder can only be used again three or four times. Further, in the reception of very rapid transmissions, it is necessary to slow down the speed of the phonograph to such an extent to render the signals readable for transcription, that a drop in tone of one or two octaves will occur thereby rendering it extremely difficult to read the signals.

In spite of these objections, the method of reception by means of the phonograph has rendered, and still is rendering, good service in certain receiving stations.

Experiments have also been conducted in replacing the phonograph recording by magnetic recording, employing the telegraphone due to Poulsen. As is well known, this apparatus consists of a long steel wire passed slowly against the electromagnet of a telephone. Each variation of the current conveys to the steel wire a trace of residual magnetism; and when the wire is again passed through the field of an electromagnet these traces of residual magnetism produce the repetition in another telephone of all the sounds initially produced. In order to efface a record it is only necessary to pass the wire through the field of a rather strong magnet.

These experiments have apparently given interesting results; but we have no information that the results obtained with the telegraphone have resulted in the definite installation of such apparatus.

Special Amplifiers and Relays for Recording in W/T.

The methods of recording which still remain to be described require rather strong currents, of the order of milliamperes, often furnished by special amplifiers, known by the name of "continuous current amplifiers" or "very low frequency amplifiers."*

These two types of apparatus make use of two distinct types of circuit :— In the very low frequency amplifiers the coupling between one stage of amplification and the next is made by means of condensers of large capacity (0·1 to 2 microfarads) so as to obtain a sufficient value for the "Time constant" of the apparatus measured by the product of the values of this capacity and the resistance of the grid leaks. Variable currents which are of shorter duration than this time constant are easily recorded.

In the amplifiers described as "for continuous currents," the connection from the anode of one valve to the grid of the next is made by a battery of cells or accumulators which brings the potential of the grid to the best value for working. This apparatus has no longer any particular time constant, so that it functions equally well for currents of any frequency.

These amplifiers, which are placed after the detector valve of the high or low frequency receiving amplifiers, act in the same manner as a telegraph relay; and one obtains finally, a sufficient strength of impulse to actuate an electromagnet and thus work a mechanical recorder.

Experience has shown us that it is possible to increase the amplification up to the point of saturation of the last valve. The apparatus then functions "all or nothing"—the anode current of the last valve passing alternately from maximum to zero.

This system contributes to a certain extent to the elimination of atmospherics because the feeble atmospheric disturbances do not effect the electromagnet, and some of them, which might have added to the final current have no effect because the signals themselves produce the maximum possible current.

Similar results are obtained by using telegraphic relays, properly so called (moving-coil relays or moving-iron relays), which, actuated by the current from an amplifier, open and close the circuit of the electromagnet of a mechanical recorder.

These relays sometimes introduce errors in reception. Their construction becomes more complicated as the speed of transmission is increased, for they must respond without lag even though the current available to actuate them does not exceed a fraction of a milliampere.

G. Pierce (United States), in 1917, proposed to use as a relay a mercury arc lamp containing a grid and an anode, as in an audion, but feeding the anode with an alternating current of somewhat high frequency. While the grid potential is negative, no current flow takes place in the anode circuit, but when the potential of the grid attains a certain positive value, an arc strikes between the anode and the mercury cathode. The apparatus then rectifies the alternating current in the anode circuit, and a very considerable amount of power becomes available throughout the duration of the wireless signal which has served to render the grid of the apparatus positive.

More recently Messrs. Johnsen and Rahbek (Denmark) have produced a kind of electrostatic relay extremely rapid in action and of great sensitiveness. It appears that this apparatus will be capable of recording wireless signals mechanically at a speed of several hundred words a minute with an expenditure of electrical power of the order of milliwatts; but we have not yet had information regarding any definite employment of the apparatus. The already known principle is utilised of the apparent increase in friction under the influence of a difference of potential. The apparatus consists of a cylinder of agate which is rotated rapidly inside a little band of Prony.

* Henri Abraham and Eugène Bloch. "Amplificateurs de très basse fréquence et oscillographes, à plume; leur application à l'inscription des signaux de T.S.F." (*Revue Générale de l'Electricité*. Vol. 7, pp. 211 and 255, 1920.)

When a difference of potential is established between the stone and the band, the band is dragged and the position of equilibrium changes. A strong tension spring re-establishes the balance when the difference of potential no longer exists.

Recording on Smoked Paper—Undulators—Morse Printing.

Recording on smoked paper was studied by us in 1916 for military telegraphy.* The received currents, rectified and suitably amplified, are passed through a galvanometer apparatus fitted with a tracing point, which inscribes its movements on a moving strip of smoked paper.

Our recording galvanometer, the magneto-oscillograph, constructed by M. Carpentier, is a little four-pole movable iron type of magneto. Under the influence of currents sent into the electromagnets the movable armature turns and moves a light and rigid pen (Fig. 4). The records obtained on the smoked paper are of extreme fineness and the apparatus is robust enough to overcome, without effort, the friction of the pen on the paper. It is possible to retain a sufficient sensitiveness with complete damping by a tension spring on the movable iron, giving a frequency of vibration of less than one-hundredth of a second. The apparatus will thus follow impulses to about a thousandth of a second.

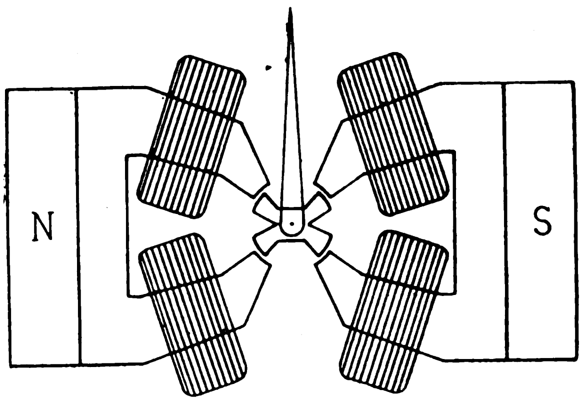


Fig 4.
Diagrammatic arrangement of magneto-oscillograph.

In order to "fix" the record, the strip is passed between little cylindrical rollers. In the model constructed in the works of Beaudouin, the rollers are worked by an electric motor, which serves also to draw out the paper and to smoke it.

In this manner we have been able to receive, not only European messages but also messages from the American stations, such as Annapolis (Fig. 5).

Other types of recorders have also been employed in wireless telegraphy, and in particular may be mentioned the Undulators, which are already in use for short distance submarine telegraphy. These consist of sensitive electromagnets, to the moving part of which is fixed a syphon pen, which writes on a paper tape which is continuously fed past it. These undulators are less rapid in action, and less sensitive than the magneto-oscillograph employing a dry point on a smoked surface, but they operate in a very satisfactory manner for the slow reception of strong signals.

In certain receiving stations good results have also been obtained, with

* H. Abraham and E. Bloch. *Revue Générale de l'Electricite*, 1920, *loc. cit.*

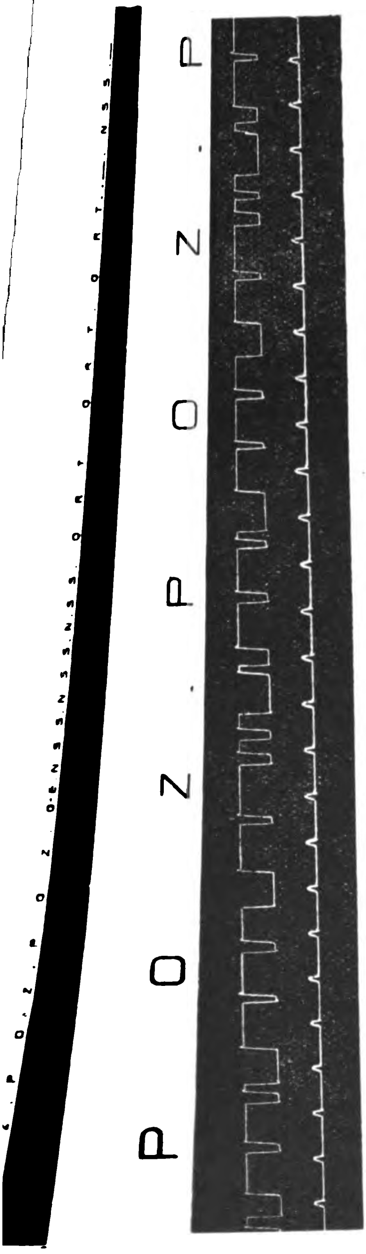


Fig. 5.

Reception in Paris of signals from Annapolis, March, 1920. Record taken with the magneto-oscillograph on smoked paper. The lower row in. each is a record of one-fifth-second impulses.

A = Reproduction of strip at ¼ size. B = Portion of strip, actual size.

fairly rapid transmissions by interposing a sensitive telegraph relay between the amplifier and the undulator. In this way there is more energy available to actuate the syphon pen, and then, by reducing the sensitiveness of the undulator, its speed of action can be increased very considerably.

It should be remembered that whenever an output energy of a few tenths of a watt is available from the amplifiers or relays, powerful electromagnets can be operated directly so as to enable the signals to be recorded by means of ordinary telegraphic or Morse apparatus. This method was used for recording the historic radiotelegram, reproduced in Fig. 6, by means of which the German High Command ordered the cessation of hostilities on all fronts at 11h.55, on November 11th, 1918.

RECORDING BY PRINTING.

But the recording of Morse signals is not sufficient; there remains one more step to reach the goal, for wireless telegraphy must reach the same stage of development as wired telegraphy in being able to record received signals on printing apparatus.

This final stage has been reached, thanks to the work of many groups of experimenters. We may mention, in particular, Messrs. H. Abraham and R. Planiol, in France; Messrs. Creed & Co., in England; and the Western Electric Company, in collaboration with the American Telegraph and Telephone Company in the United States.

The solutions put forward, which are almost the same in principle, consist

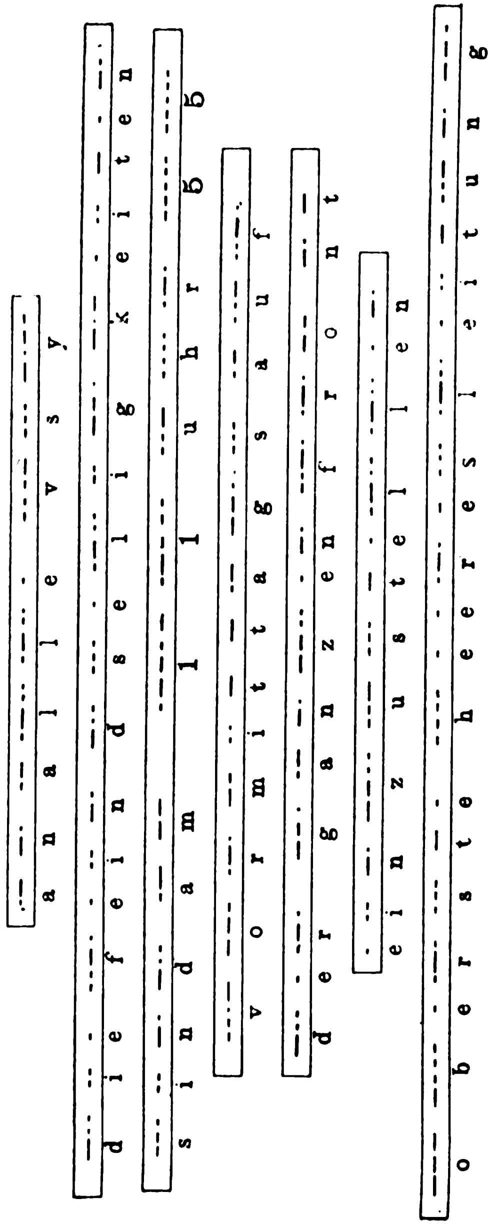


Fig. 6.

Photographic reproduction of the original Morse tape recording the radiotelegraphic order from the German High Command to cease fire on the whole front on November 11th, 1918.

in amplifying the received signals to as great a degree as possible, in order that they may actuate an ordinary telegraph relay of the printing system to be employed. It is also arranged that the transmitting station is controlled by an ordinary telegraph relay.

In printing by wireless telegraphy it is necessary that the transmitting station should have an extremely regular action. Up to the present it has been found that valve transmitters alone are suitable to the purpose; but we believe that it will be possible to make use of large arc stations and alternators.

The tests carried out by H. Abraham and R. Planiol were made with the object of making direct use in radiotelegraphic work of the Baudot apparatus so extensively employed in international line telegraphy.

The transmissions from a valve transmitting station are controlled by means of a Baudot relay of the ordinary pattern, which is operated by land line in the usual way. At the receiving end, the high frequency amplifiers, followed by an amplifier for continuous current, actuate in their turn a Baudot relay, also of the ordinary type, and the latter serves to forward the telegram over the land lines to the office of destination, where the distributors are located, and the so-called translating apparatus. This office of destination thus receives the wireless telegram under the same conditions as ordinary land line telegrams.

Traffic trials have been made with this sytem between Nogent-le-Rotrou and Paris. The results were satisfactory, and in particular it was proved that, thanks to the employment of the Baudot telegraph, it was possible to maintain perfect synchronism between the transmitting and the receiving apparatus in spite of "atmospherics," even when the experiment was tried of reducing the power of the transmitter up to a point when the reception began to become a little uncertain.

It has thus been established that it is possible to introduce a wireless telegraph transmission into the continental network of the Baudot telegraph system, and one can, for example, in certain cases, substitute a radiotelegraphic connection for the more expensive and less reliable submarine cable connection. It may reasonably be expected that a combination of wireless telegraphy with Baudot telegraph apparatus would result in the ability to deal with more traffic than could be handled by two submarine cables working at full load.

In the Creed experiments, the manipulation of the transmitter is automatic and the transmission is made with a Wheatstone perforated tape. The principle of reception in the Creed system consists in the utilisation of the currents supplied by the amplifiers to actuate an electro-magnet, which controls the perforating machine. The radiotelegrams are thus received in the form of perforated tape. This tape is then passed through an ingenious apparatus, which does the work of printing the messages in roman characters.

The Western Electric Company, though they have not yet published any esults, have been good enough to supply us with information. They have een successful in conveying an ordinary "Western" printed telegram by ireless between New York and Cliffwood. The messages were transmitted y wireless by a valve transmitting apparatus located at New York; they were eceived on amplifiers at Cliffwood, where they actuated a telegraph relay hich transmitted them back to New York, where the printing apparatus was stalled. Thousands of words were transmitted in this manner without rors.

Conclusions.

The facts which we have recorded above indicate that for some months st wireless telegraphy has entered upon a new stage in its development. e reception of messages by mechanical means has at last reached a practical

commercial value; this is a matter of no small consolation to those, who, like ourselves, have endeavoured to contribute their best efforts to the fulfilment of this object.

But the condition now exists, thanks to the efforts of all concerned, that the technique of reception is in advance of that of transmission. We are in a position to receive and record wireless messages at whatever speed we desire; one can print, if required, at the rate of ten or twenty thousand words an hour. Unfortunately, to obtain good reception good transmission is also essential; and it must be recognised that it is not yet very easy, particularly in the case of large stations, to regulate the working for such extremely high speeds. It is necessary, also, that the wavelength of the transmissions should be maintained rigorously constant throughout the transmission, and from day to day, and this state of affairs is not always attained. It will be necessary, finally, to overcome the effects due to atmospheric disturbances, and it would be very interesting to go into the consideration of the results which have been obtained in this direction. But that is another story.

THE EARTHING RESISTANCE OF ANTENNAE.

By Dr. Ing. A. Meissner.

(Communication from the Laboratory of the Gesellschaft für drahtlose Telegraphie.)

FOR many years one of the most important problems of radiotelegraphy has been the question of the best type of transmitting antenna for high-power work. Prior to 1911 no satisfactory solution had been found. On the one hand L-shape antennæ of 1,000 to 2,000 metres in length and 50 to 80 metres height had been built, while, on the other, the umbrella-shaped antenna was preferred by many. The former type was said to have a very pronounced directive effect, and theories have been worked out to prove the superiority of this type of antenna. It had also been proposed to use earth-antennæ for transmission purposes.

In order to determine the basis for the design of the long-distance radio stations which were projected about that time for erection in the German Colonies, the Telefunken Company resolved to carry out extended and more detailed experiments with antennæ. These researches were concerned with (1) the radiation from the antenna, and (2) the design of its leading dimensions, viz., the predetermination of its capacity, natural frequency and damping and the influence of the insulation of the metal parts of the masts, supporting wires, etc. The first experiments carried out at Nauen were followed by tests over longer distances, between Nauen and Jena. The following were the main results obtained at that time, relations which are still generally used in the design of antennæ :—

(1) That the statement that the radiation resistance is proportional to h^2/λ^2 is true for all shapes of antennæ.

(2) That within wide limits if the mean height is the

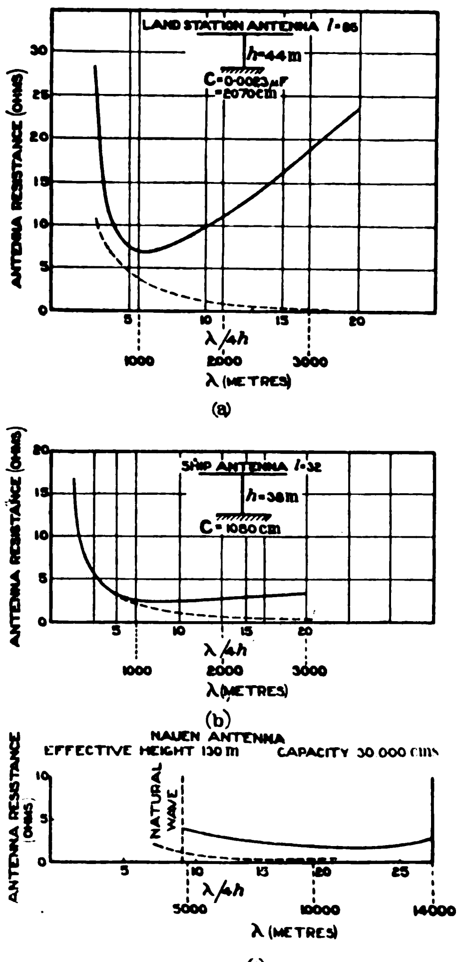


Fig 1.

same, the shape of the antenna has no influence. Umbrella, T–and L–aerials are equivalent if the earthing or counterpoise is the same; but an L–aerial is not so good if the length l is greater than four times the height h, on account of the losses in the ground.

(3) The directional effect of an L–antenna, when the loading * is more than 20 per cent., is practically negligible.

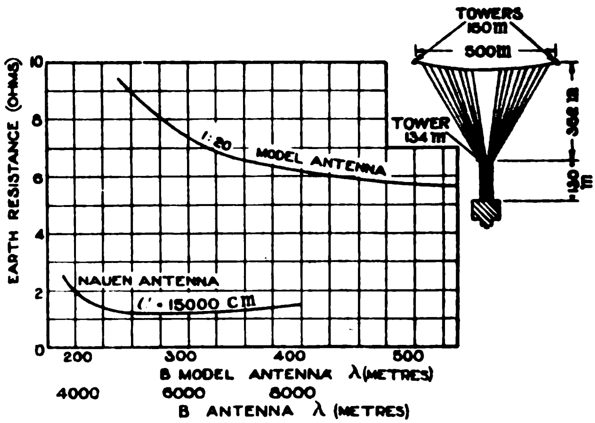


Fig. 2.

A solution of one problem was not obtained at that time, viz., by what means can the earthing resistance of the antenna be reduced?, and this question became of greater importance during the following years, since the efficiency of the whole antenna, especially for large aerials, depends mainly on the earthing resistance. Although the efficiency of the oscillation generator has during the past few years been increased up to 70 to 80 per cent, the

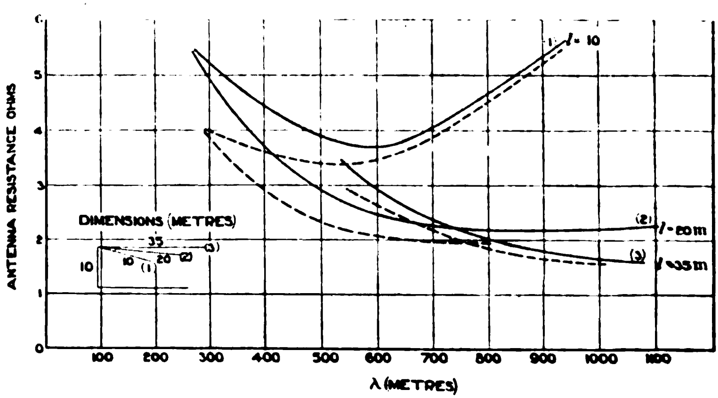


Fig. 3.

* This term is used throughout the article to represent the ratio $\lambda/4h$ *i.e.*, it is a measure of the amount the wavelength of the aerial increased (by loading) above the value $4h$.—ED.

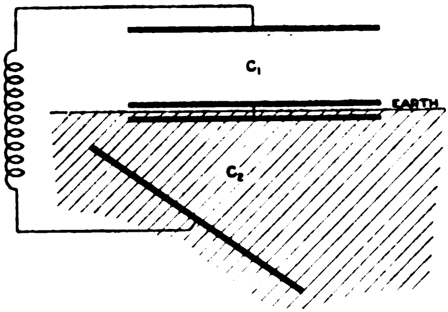


Fig. 4.

antennæ have become less effective as longer and longer wavelengths have been used, in order to decrease the absorption and to reduce the interference from other stations. Although the highest practical towers have been used, a radiation resistance of between 0·1 and a little over 0·3 ohm was the maximum obtained at wavelengths of 12 to 20 kilometres, while at the same time the earth resistance has increased to from 1½ to 5 ohms. Hence the efficiency of the whole antenna is but 5 to 15 per cent. It is obvious, therefore, that the problem of increasing the effectiveness of large antennæ can only be solved by a reduction of the earthing resistance.

The following results of research work indicate the best way in which to effect an improvement in the efficiency of large antennæ.

In Fig. 1 are given curves of the antenna resistance as functions of the wavelength or rather of the factor $\lambda/4h$, for the three chief types of antennæ: a normal land aerial, a ship aerial, and the aerial of a long-distance radio station. The curves show that the antenna of a high-power station having a capacity equal to 30,000 centimetres, has a much smaller resistance (2 to 3 ohms) than the small T antenna with a capacity of 1,000 centimetres, when both are loaded to the same extent, *i.e.*, the resistance of the antenna decreases when the dimensions are enlarged. (The earth resistances are indicated by the dotted lines.)

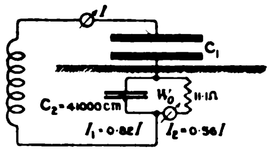


Fig. 5.

In 1913 and 1918, M. Abraham treated this problem theoretically and obtained the following result: that the product of the conductivity of the ground and the dimensions of the aerial is a constant. According to Abraham's theory, the earthing resistance of an antenna should be reduced to half if the dimensions are enlarged in the ratio 1 : 2 and the conductivity of the ground remains the same. The curves in Figs. 1a and 1c show that this theory is not rigidly obeyed in practice. Fig. 2 shows this more plainly. It gives the curves of the true earth resistance of a large fan-shaped L–antenna of mean height 80 metres, length 400 metres, breadth at the end 550 metres, and capacity 15,000 centimetres, and also of a model of the same antenna built on the scale of 1 : 20. It is seen that although the resistance is greatly reduced, it is not in the ratio of one-twentieth, although the ground was the same. It is, however, difficult to be certain whether the ground is identically the same near the earth wires at a depth of 2 to 5 centimetres and at a depth of 40 to 60 centimetres. Abraham's theory can only be applied if *all* the dimensions of the antenna are changed in the same scale, but it does not apply when only single ones are enlarged while others remain constant.

The question as to whether the earth resistance for a given wavelength can be reduced only by enlarging the antenna is a particularly important one. The curves in Fig. 3 relate to this question and refer to the case of twelve-wire umbrella type antenna, height 10 metres, length of wires 10, 20 and 35 metres, span 60 metres and with twelve earth wires, each 25 metres long. The curves show the great improvement obtained on long wavelengths when the antenna is enlarged from 10 to 20 metres, the resistance falling

more rapidly than proportionally to the increase in size. For example, at a wavelength of 900 metres :—

$$\frac{\text{Resistance of 20-metre aerial}}{\text{Resistance of 10-metre aerial}} = \frac{2 \text{ ohms.}}{5.3 \text{ ohms.}}$$

The proportionality, however, is not retained when the length of the antenna is increased from 20 to 35 metres, nor when shorter waves are used nearer the natural frequency of the antenna. These values were possibly somewhat influenced by the special conditions of the ground, since part of the area was flooded with water. The rapid rise of resistance indicated by curve 1 in Fig. 3, as the wavelength is increased is very striking. Howe has assumed that this rise must be a straight line, and consequently due to pure dielectric losses, which are inversely proportional to the frequency, and therefore directly proportional to the wavelength.

The antenna can be regarded as consisting of two capacities, the loss-free air condenser C_1 (Fig. 4) in series with the condenser C_2 having a bad dielectric. This arrangement is equivalent to that shown in Fig. 5, in which C_2 is repre-

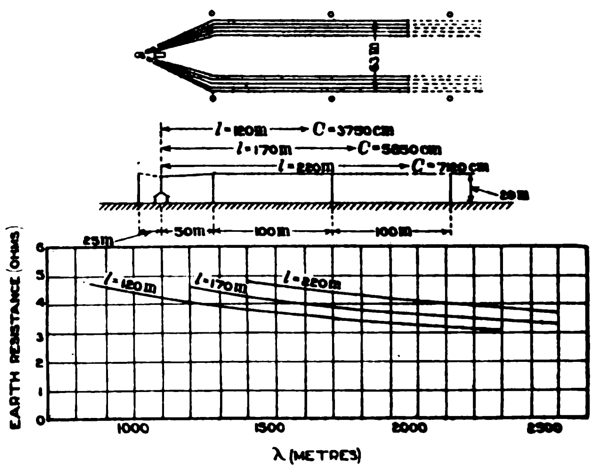


Fig. 6.

sented by a loss-free condenser in parallel with an ohmic resistance. The current I (Fig. 5) increases as C_2 is increased and as the wavelength is reduced. The resultant effective resistance W (*i.e.*, the measured earth resistance) therefore increases as the wavelength is increased and falls with increased capacity C_2. In general C_2 rises when the antenna capacity C_1 is increased, *i.e.*, W is reduced if the antenna capacity is increased. In this case the condition is that C_2 is increased if C_1 is increased—that is, that when the antenna is enlarged, the additional capacities C_1 and C_2, which are equivalent to the existing capacities are connected in parallel. This is not the case with some shapes of antennæ ; for instance, with L-shaped antennæ the values of W_0 and C_2 can be determined from the resistance curves in Fig. 3, and thus the ratio of the currents in both branches can be determined. Fig. 5 gives these current values for a wavelength of 650 metres.

Increasing the antenna capacity is, therefore, one means of reducing earth resistance ; but, unfortunately in practice, the fundamental wavelength of the aerial soon becomes comparable with the working wavelength, and this, again, causes the resistance to rise owing to proximity to the natural frequency of aerial. Hence it is difficult to reduce the resistance below 2 to 2·5 ohms, even when the capacity conditions are the most favourable. This

method of reducing the earth resistance is of no use for unsymmetrical antennæ, as then the resistance increases when the capacity is increased. Fig. 6 gives resistance curves for L-antennæ of different lengths (height of mast 20 metres, breadth of aerial 63 metres, number of wires 10, lengths 120, 170 and 220 metres, capacities 3,750 centimetres, 5,850 centimetres and 7,120 centimetres). From these curves it can be seen that when the capacity of the aerial was increased in the ratio 1 : 2, the resistance increased by 25 to 30 per cent. (*see* curves for 120 and 220 metres on wavelength 1,500 metres). These figures indicate that the additional capacity obtained by increasing the size of the aerial does not add in parallel to the original area; that is, that the capacity of C_2 in the diagram in Fig. 5 has been decreased instead of increased by increasing the antenna capacity C_1.

The question must now be considered whether a further reduction of the earth resistance is possible by the use of a counterpoise such as was first introduced by the Telefunken Company about this time. Fig. 7 shows the change in resistance when all the dimensions of an antenna were altered in the ratio of 1 : 2 and when a small counterpoise was used, the two aerials being respectively 10 and 20 metres in height, 10 and 20 metres in length

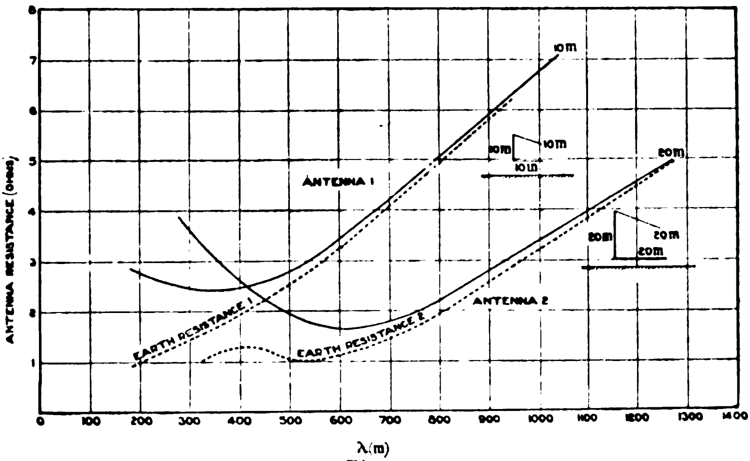


Fig. 7.

and having in each case eight wires and with a counterpoise of eight wires, firstly 10 metres long and, secondly, 20 metres long. Abraham's theory does not apply to this case, but it is seen that the resistance decreases if the antenna capacity is increased at a constant wavelength ($\lambda > 500$ metres). Also if the height of the antenna and the wavelength are kept constant a similar reduction of resistance takes place if the capacity is increased. Fig. 8 shows these results when using a larger counterpoise. The 12-wire umbrella type aerial had, in this case, a height of 30 metres, a span of 80 metres and wire lengths of 15, 25 and 50 metres, giving capacities of 1,000, 1,400 and 2,700 centimetres respectively. The counterpoise consisted of 50 wires 40 metres in length connected with a further 100 wires 40 metres in length. The resistance was found to decrease greatly with the capacity, and could be brought down below 1 ohm, that is, to a much lower value than was possible when using an earth connection, even if the aerial capacity was very large. Fig. 9 gives corresponding values for an L-antenna with a larger counterpoise (antenna 4 wires of 135 metres, height 21 metres, counterpoise 12 wires of 200 metres). It is seen that in this case the resistances are large for short wavelengths, but can be reduced below 1 ohm for long waves.

In 1915 a larger counterpoise was built at the Sayville station, in America,* and measurements were made on it by Professor Zenneck. At that time the antenna was of an umbrella shape, with a radius of about 240 metres, a capacity of 11,800 centimetres and a mean height of about 65 metres. The counterpoise extended a little beyond the area covered by the antenna, and had 56 wires, each about 265 metres long at a height of 2·5 metres, the underground water being 6 metres deep. The total resistance of the antenna was 1·55 ohms at a wavelength of 4,640 metres, this resistance being made up of an earth resistance 0·5 to 0·6 ohm, a radiation resistance of 0·31 ohm and a coil resistance of 0·7 ohm. These counterpoises were not yet large enough, as was shown by an arrangement of Rendahl's, at Karlsborg, in Sweden. The antenna there was of the cage type, suspended between two masts 210 metres in height, the length of the cage was 400 metres and its diameter 30 metres. It consisted of 60 wires and had a capacity of 8,000 centimetres. The ground below the antenna is rocky and was covered with a close counterpoise extending to a distance of more than 400 metres. The counterpoise wires were stretched at a height of 5 metres above ground at a distance of 3 metres apart, and were supported by 500 telegraph poles.

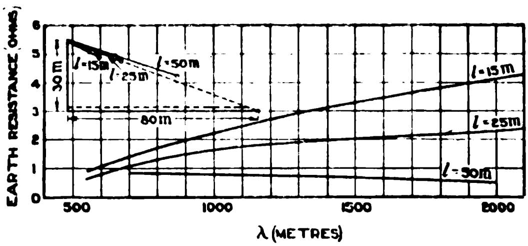


Fig. 8.

Four hundred kilometres of copper wire 1 millimetre in diameter, were used for the construction of the counterpoise. Rendahl gives the following values for the resistance of this antenna :—

Wavelength.	Radiation Resistance.	Total Resistance.
3600	4·95	5·2
5400	2·2	2·9

As the total resistances given above include the resistance of the loading coils, and these coils, having an inductance of 90,000 centimetres, certainly possess a resistance of about 0·7 of an ohm at a wavelength of 5,400 metres, the earth resistance must be less than 0·1 of an ohm. Thus, for the first time, the ideal small earth resistance such as is needed for long-distance wireless stations has here been attained. These small values have, however, only been obtained at great cost and the expense would greatly increase for a high-power station with a large area of antenna. For such antennæ the counterpoise would require a space of 5 to 6 kilometres if the wires are about 2,000 metres long.

On account of the large expense, the Gesellschaft für drahtlose Telegraphie was obliged to return to earth connections. After extended experiments an arrangement was found by which similar small resistances were attained, such as those of Rendahl's using large counterpoises. The principle employed is either to make the ground connections just at the point where

* *Jahrbuch der drahtlosen Telegraphie und Telephonie* 11, p. 235, 1916.

the lines of electric force from the antenna enter the ground, so that long current paths and eddy current losses in the ground are avoided, or to distribute the current from the generator on to a number of earth connections, such that each earth-point carries only as much current as corresponds to the lines of force from the antenna which enter the earth near that point.

When it is not possible to cover the whole surface of the ground with earth connections, then these should be placed where the greatest number of lines of force from the antenna enter the earth. It is in this respect that the greatest number of mistakes have been made in the design of aerial systems in the past, as usually the earth connections have been arranged in such a way that the current entered the ground at the centre of the antenna, or at a distance of about 100 metres from the centre, although the radius of the area covered by the antenna was from 400 to 500 metres. For all types of antennæ the centre line of the group of lines of force between the antenna and the ground lies at the extreme border of the area covered by the antenna. This fact may also be deduced from the simple formula given by Austin for the approximate predetermination of the capacity of antennæ, viz. :—

$$C = \left(0{\cdot}88\,\frac{a}{h} + 4\sqrt{a}\right) \times 10^{-6} \text{ microfarad.}$$

where a equals area of antenna and h equals its height. The capacity may be regarded as consisting of two parts; the first part is that of a simple plate condenser, having surfaces approximately equal in area to that of the

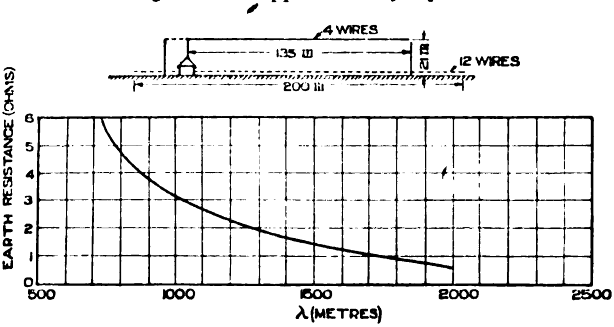


Fig. 9.

antenna, and the second part corresponds to the border line radiation field in the space beyond the area of the antenna. For the antennæ of high-power stations having a radii of 500 metres and a height of 200 metres, the second part is larger than the first, in the ratio of $35{\cdot}5 \times 10^{-3}$ to $34{\cdot}5 \times 10^{-3}$ microfarads. In other words, the major portion of the capacity of the whole aerial is due to the lines of force which reach the ground beyond the area covered by the antenna. The distribution of the current entering the ground can be obtained accurately from the field of force of the antenna, as determined by Maxwell (Fig. 10).

If the surface of the ground under the antenna is divided up into a number of rings of equal width (for example, 1 metre wide), and if the intensity of the lines of force entering each ring is determined and set out on a diagram, the total current due to the lines of force entering the ground may be represented by the shaded area A, in Fig. 10. The centre of gravity of this current area lies near the border of the area covered by the antenna, so that if the current paths through the ground are to be reduced as much as possible, the earth connections should be made on the border of the antenna area and the current leads from the transmitter brought to this position.

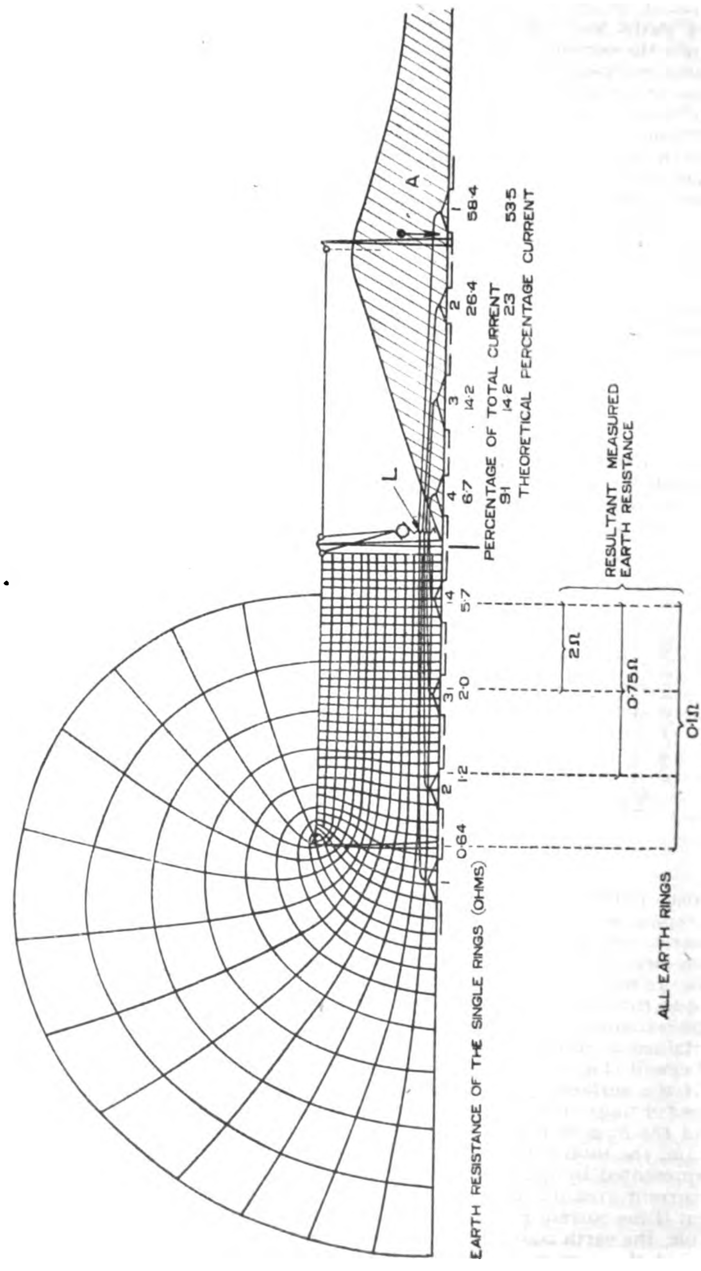

A
L
1
2
3
4
58·4
26·4
14·2
6·7
535
23
142
91
PERCENTAGE OF TOTAL CURRENT
THEORETICAL PERCENTAGE CURRENT
RESULTANT MEASURED
EARTH RESISTANCE
1
2
3
4
0·64
1·2
2·0
5·7
2Ω
0·75Ω
0·1Ω
EARTH RESISTANCE OF THE SINGLE RINGS (OHMS)
ALL EARTH RINGS

Fig. 10.

If, however, the current is led into the ground at the centre of the antenna, the whole of the current which enters the ground beyond the area covered by the antenna (*i.e.*, more than half of the total antenna current) must flow back through the earth along the whole length of the antenna. In the right-hand side of Fig. 10 is given the current distribution of an actual antenna, which was built as a model for an antenna of a high-power station on a scale of 1 : 20. This antenna was pentagonal in shape, as may be seen from the plan in Fig. 11. Its radius was 25 metres, its height 10 metres above the ground, and capacity 2,065 centimetres. The earth connections were arranged in four concentric rings under the whole of the antenna, and extended a distance beyond the area of the antenna equal to its height. Each earth connection was star-shaped (Fig. 12). Four conductors were led above the surface of the ground from the centre O (Fig. 12) of each earthing point to the four corner earth connections. Twenty-eight earthing "stars" were arranged in the first ring from the outside, 25 in the second, 15 in the third, and 5 in the fourth. Eighteen connections were made from the first ring to the centre of the aerial 13 from the second, 8 from the third, and 2 from the fourth. These connections were secured to the central mast at a height of about 3 metres. All the earth connections in each ring were connected together, and the current distribution to the various rings of earth points could be varied as required by adjusting the connections to the coil L (Fig. 10) or by adding, if necessary, more or less inductance in each earth connection. If the currents were adjusted by means of this inductance so that the whole system had the lowest resistance, the distribution of the total current in the four rings was as shown on the right-hand side of Fig. 10, the outermost ring carrying more than 50 per cent. of the total current. The current distribution in each ring as calculated from the diagram of the lines of force given in the upper left-hand half of Fig. 10 is set out in the second row of figures beneath the right-hand half of Fig. 10, the upper row of figures giving the actual currents that were obtained. On the lower left-hand side of Fig. 10 the earth resistances that were measured when single rings of earth connections were used are set out, the second and third lines giving the resistances when two and three rings of connections were used, and the fourth line the resistance of the whole combination of connections. When only the fourth, or inner, ring of earth connections is used, which gives an earthing scheme corresponding to those normally used, the resistance was 5·7 ohms, which is a reasonable value for an earthed antenna of this size. If the outer ring only

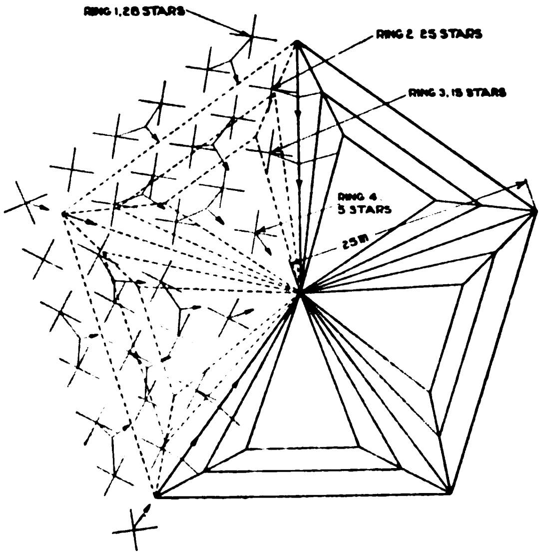


Fig. 11.

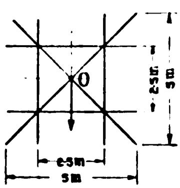


Fig. 12.

was used, the resistance fell to 0·64 ohm, but by combining all the rings together the resistance fell to less than the tenth of an ohm. This resistance was measured at various wavelengths down to 400 metres, above 1,200 metres it rises a little, and at 1,835 metres it was still less than 0·4 ohm. These measurements show that the earthings under the centre part of the antenna are of little value and could be omitted were they not required as connections to the outer border.

In later experiments the star-shaped earth connections were replaced by single pipes, by which means the earthing scheme was greatly simplified. Pipes, 3 centimetres in diameter and 1 metre in length, were driven into the ground to different depths, and the resistance measured in each case. These experiments indicated that the star-shaped connections shown in Fig. 12 can be replaced by four pipes at a depth of ½ metre at the four corners of the star.

It has been concluded from these measurements, by consideration of Abraham's model aerial theory, that we can with certainty expect that the resistance of an antenna twenty times as large will remain far below the values quoted above, and consequently that possibly fewer rings of earth connections will be required. An earthing scheme of this type is proposed for the projected extension of the Nauen station. As the antenna will have a mean effective height of from 190 to 200 metres, the radiation resistance will be from 0·3 to 0·33 ohm at a wavelength of 12,600 metres. As the resistance of the loading coils and of the antenna wires can be reduced below 0·3 ohm, the total resistance of the antenna should lie between 0·6 and 0·7 ohm. The efficiency of the new antenna will thus be about 50 per cent. instead of 7·5 per cent., as at present.

THE BIRTH AND EARLY HISTORY OF LONG-DISTANCE WIRELESS TELEGRAPHY.

By W. S. Entwistle.

On June 2nd, 1896, Senatore (then Signore) Marconi lodged his application for the first British patent for wireless telegraphy, and during the latter half of that year he gave demonstrations of wireless telegraphy over ranges of the order of one or two miles.

Early in the year 1901, that is, not more than four and a half years after the date of the application for the first patent, the distance over which messages could be interchanged had been increased to about eighty-five miles. Such progress could not be regarded as other than very satisfactory. It certainly exceeded the expectations of the many persons in the scientific world who had predicted that insuperable difficulties would be encountered in the attempt to extend the range of wireless telegraphic communication beyond a few miles. The view generally taken had been that, all other reasons apart, the curvature of the earth would impose an insuperable barrier to successful communication over distances of the order of fifty miles or so, except in the case of stations situated at a considerable elevation above the surrounding country. But although the fact that successul communication over a range of eighty-five miles between vessels at sea had been accomplished early in 1901 had completely discredited the views previously held with regard to the various difficulties that would probably be encountered, it had in no way prepared anybody to anticipate the sensational developments that took place during the year 1901.

On December 12th, 1901, that is, almost exactly twenty years ago and less than five years after his application for the first British patent for wireless telegraphy, Senatore Marconi succeeded in receiving wireless telegraphic signals at St. John's, Newfoundland, from Poldhu, Cornwall, a distance of 2,100 miles. This achievement, which was of a nature so sensational that its announcement was at first received by the scientific world with considerable scepticism, must be regarded as the birth of long-distance wireless telegraphy.

In order to form anything like a correct estimate of the merits of Senatore Marconi's achievement one has to bear in mind that twenty years ago the general knowledge and experience of high-frequency electrical phenomena was very limited. The radio engineer of to-day, who has at his command all the present-day appliances and facilities to assist him in his work, must find some difficulty in placing himself in the position of the worker of twenty years ago, who, working largely in the dark, was obliged to create for himself the very means for putting his ideas to the practical test. It is, therefore, of considerable interest to examine in the light of subsequent events the plans and means that were devised for this first attempt to signal across the Atlantic Ocean.

In April, 1900, Senatore Marconi had taken out his important patent, No. 7777, in which is described a transmitter having a closed oscillating circuit inductively coupled and tuned to the aerial circuit through an oscillating transformer, or "jigger." The closed circuit contained a condenser, a spark gap and the primary winding of the jigger in series. The condenser was charged by an induction coil and discharged through the spark gap and the primary winding of the jigger. The discharge of the condenser produced oscillations in the closed circuit, and the energy stored in the condenser gradually became transferred to the aerial or secondary circuit. This combination of a closed circuit forming a reservoir of energy

coupled and tuned to an open radiating circuit, gave a much more persistent train of oscillations in the aerial than did the earlier plain aerial arrangement that it superseded. The practical effectiveness of this new device was fully demonstrated when, by means of it on February 11th, 1901, Signore Marconi established communication between Niton (in the Isle of Wight) and the Lizard, Cornwall. The distance between these stations was 196 miles, or more than twice the maximum distance previously accomplished.

In October, 1900, Signore Marconi had commenced to build a high-power station at Poldhu, Cornwall, for the purpose of his coming attempt to signal across the Atlantic, and by the end of the year the engine house of the station was completed. Encouraged by the successful results of the Niton–Lizard tests, Signore Marconi, on February 14th, 1901, commenced the construction of the aerial and the transmitting plant at Poldhu. These features of the station were to be essentially similar to those of the Niton and Lizard stations, except as regards their increased size, and such alteration to detail as the increase of size necessitated. The transmitting aerial, which on previous occasions had generally consisted of two wires supported in a nearly vertical position on a single mast about 150 feet high, was at the Poldhu station to consist of several hundred wires in the form of an inverted cone, supported by a ring of twenty masts, each 215 feet high. The apex of the cone was to be connected directly to the secondary winding of the jigger *via* a "leading in" terminal in the centre of the roof of the transmitter room. This type of aerial was, however, never used for transatlantic tests, because the twenty masts that were intended to support it were wrecked in a gale on September 20th, 1901.

The destruction of the masts, although it represented a financial loss of several thousands of pounds, was not allowed to interfere with the continuance of the work, and early in October of the same year two jury masts, about 160 feet high and 200 feet apart, had been erected. Between these masts was suspended a fan-shaped aerial, consisting of fifty-four 7/20 gauge copper wires, and it was this comparatively small aerial that was employed for transmitting when the first transatlantic signals were received in Newfoundland on December 12th, 1901.

In the meantime the Marconi Company had acquired a site at Cape Cod, near Boston, Mass., U.S.A., for the purpose of erecting thereon another station similar to that at Poldhu. In November, 1901, the masts at Cape Cod unfortunately suffered the same fate as that of the Poldhu masts, and it was for this reason that Senatore Marconi decided to employ kites and balloons for supporting the receiving aerial during the first attempt to receive the Poldhu signals on the continent of America.

During the early experiments with the Poldhu transmitting plant the oscillation transformer through which the aerial was coupled to the closed oscillating circuit was of the same design as those employed at Niton and the Lizard, the cross section of the windings only being increased to enable them to deal with the larger currents that were employed.

The condenser in the closed oscillating circuit was constructed with glass plates 16 inches square, coated on each side with tinfoil and immersed in linseed oil in stoneware boxes. Each box contained twenty plates, and the capacity in each box was between 0·05 and 0·06 of a microfarad.

The generating plant installed for charging the condenser consisted of a 32 h.p. oil engine driving a 25 kW 50-cycle 2,000 volt alternator, and two 20 kW transformers were provided for stepping this voltage up to 20,000, or 40,000, if required. The general arrangement of the circuits employed when the first signals were received in Newfoundland is shown in Fig. 1. The alternator D, which was belt-driven by the oil engine, was connected through the choker CH to the step-up transformer T. The secondary voltage of the transformer was used to charge the condenser C_1 and the discharge path for the latter was through the primary loop of the air core transformer J_1 and the spark gap S_1. Air core "protecting" choke coils P CH_1 and P CH_2

were inserted between the oscillating circuit and the transformer secondary winding. The condenser C_2 became charged from the secondary winding of the air core transformer J_1, which had a step-up ratio of 1 to 10. The discharge path of the condenser C_2 was through the primary loop of the air core transformer J_2 and the spark gap S_2. The step-up ratio of J_2 was 1 to 7 and the two ends of its secondary winding were connected to the aerial and earth respectively. The length of the gap S_1 was 7·5 mm and that of S_2 35 to 40 mm. The capacities of C_1 and C_2 were 1·4 microfarads and 0·036 microfarads respectively.

It will be noted that no aerial tuning inductance was employed, and the circuit consisting of C_2, S_2 and the primary loop of J_2, was tuned to the aerial circuit by adjusting the value of the capacity of C_2. The circuit, consisting of C_1, S_1 and the primary winding J_1, was then tuned to the circuit consisting of C_2, the primary winding of J_2 and the secondary winding of J_1, and this was effected by adjusting the value of the capacity of C_1. Finally, the circuit consisting of the alternator D, the transformer T and the inductances CH P.CH_1 P.CH_2 C_1 and the primary loop of J_1 were either tuned to the frequency of the alternator by adjusting the value of the inductance in CH, or the alternator frequency was altered to suit the time period of the circuit. The wavelength of the aerial circuit was not measured, but was probably about 700 or 800 metres.

A certain amount of trouble was experienced before these circuits could be got to work satisfactorily. There was a marked tendency for an alternating current arc to form across the primary spark gap S_1, and when this occurred the spark at S_2 naturally failed. Oscillating discharges of sufficient duration to form the dots of the Marconi code could be readily obtained, but satisfactory dashes could not be produced with certainty. For this reason it was decided to employ the letter S instead of the letter V, which was generally used for practice purposes, as the test signal for the Newfoundland trials, as this letter in the Morse code contains no dashes, and, by this means, the necessity for transmitting dashes was avoided. Reference is made to this point, because when it was first announced that wireless signals had been received across the Atlantic, the suggestion was quite seriously made in certain quarters that atmospherical electrical disturbances had been mistaken for the signals originating at Poldhu. In support of this contention it was stated that it was well known that such atmospheric disturbances very frequently produced noises in telephone receivers consisting of a regular series of dots in groups of three, corresponding to the letter S in the Morse alphabet.

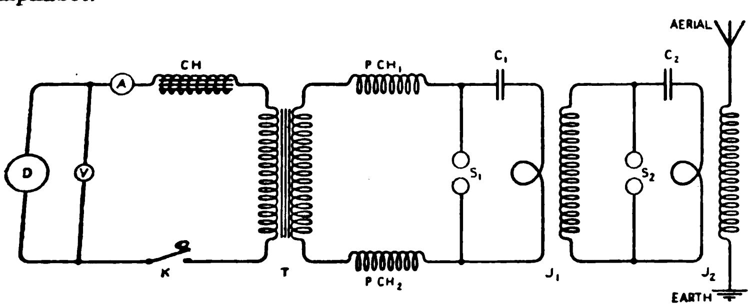


Fig. 1

On this point *The Electrician*, on January 17th, 1902, stated: "There are, however, many competent to form an opinion who consider that Mr. Marconi was deceived in believing that he heard faintly in a telephone the expected signal from Cornwall . . . . . ."

" It is quite possible Mr. Marconi may transmit any Morse signal between England and America, but he certainly has not done so yet."

Six weeks later (February 28th) the same journal remarked: "Meanwhile let the British public remember that the real foundation for all this talk about supplanting ocean cables is as flimsy as gossamer—nothing more, in fact, than an experiment with a somewhat unruly kite on the shores of Newfoundland by which Mr. Marconi heard faint clicks in a telephone. Only that and nothing more."

All question as to the genuineness of the signals received in Newfoundland was set aside when, in February, 1902, Senatore Marconi received on board the s.s. *Philadelphia* readable messages up to a distance of 1,551 miles, and signals up to a distance of 2,099 miles from Poldhu. These messages and signals were received on a Morse inker, and the Morse tape records of them are still in existence.

The arcing trouble was subsequently found to be largely due to excessive damping in the alternator circuit, caused by the large iron losses in the two inductance coils which formed the primary choke CH. The working of the circuits was later on greatly improved by removing the iron cores of CH and raising the frequency of the alternator to compensate for the consequent reduction in the time period of the circuit. A further improvement was made by replacing the spark balls at S_1 by two massive iron discs, which were slowly rotated so that the surfaces subjected to the action of the spark were changed continually. The " splitting " of the dashes, due to occasional arcing at the primary spark gap, was, however, not altogether eliminated until towards the end of 1902, when the circuits were rearranged in accordance with the diagram in Fig. 2.

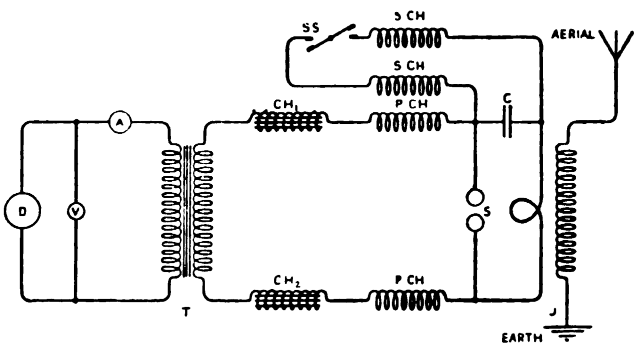


Fig. 2

Further difficulty was experienced in devising a satisfactory method of signalling. During the early transatlantic trials a switch K (Fig. 1) was used for making and breaking the primary circuit of the transformer T. It had a large number of pairs of contacts in series, and was worked by hand by means of a wooden lever. A good deal of manual effort was required to work the switch at ordinary telegraph speeds, but speeds between 10 and 15 words per minute were readily obtained with a signalling load of 8 or 9 kilowatts.

During the successful receiving experiments that were made in Newfoundland in December, 1901, the receiver was connected to a vertical wire about 400 feet long elevated by a kite. This arrangement was not very satisfactory, since variation in the wind caused variations in the electrical capacity of the wire. Consequently an ordinary syntonic receiver was not the best suited for the purpose in hand. The signals were received, however, with three types of receivers, namely, one containing loose carbon filings, another, designed by Senatore Marconi, containing a mixture of carbon dust

and cobalt filings, and a third, known as the "Italian navy coherer," consisting of a globule of mercury between two plugs, one of steel and the other of carbon. The tests were brought to an end by the action of the Anglo-American Telegraph Company, which claimed all telegraphic rights in Newfoundland, and who apparently saw reasons for fear in the prospect of the commercial development of transatlantic wireless telegraphy.

In February, 1902, the receiving tests were continued on the s.s. *Philadelphia*, and in this case the receiving aerial was fixed to the mast, the top of which was about 200 feet above sea-level. The electrical capacity of the aerial thus remained practically constant, and very good results were obtained with the ordinary syntonic receiver. Readable messages were recorded on tape by means of a coherer and a Morse inker at 1,551 miles, and indications were received up to 2,099 miles. None of the various types of receivers used in the previous Newfoundland tests would give signals over a range of more than 900 miles. The most important result of the tests, from a scientific point of view, was that the signals transmitted during the daytime were never received at a range greater than 700 miles. This shortening of the range during the hours of daylight constituted one of the most serious problems that engaged Senatore Marconi's attention during the following years, and the investigations that he made in elucidating the matter lead later on to the discovery of many interesting and complicated phenomena, such as the great variation of signal strength during the period of sunset and sunrise, and the difference in range obtainable with given installations when employed in transmission east to west and north to south respectively. Prior to the year 1902 these phenomena were entirely unknown, owing to the fact that they had not asserted themselves to any marked degree over the comparatively short ranges that had hitherto been attempted. Even to-day entirely satisfactory interpretations of these phenomena are wanting; but in 1902 Senatore Marconi discovered a partial solution to most of the difficulties occasioned by them. He found that increasing the length of the waves employed caused the daylight range to approach that of the night-time, and minimised the variations.

During the same year Senatore Marconi invented his well-known magnetic detector, and with it carried out a long series of receiving tests on board the Italian battleship *Carlo Alberto*, which had been placed at his disposal by the Italian Government. On board this vessel signals were received from Poldhu in various parts of the world, such as Kronstad, Ferrol and Glace Bay.

The reception of Poldhu signals in Newfoundland caused the Canadian Government to show interest in the question of establishing a direct wireless telegraphic service between England and Canada, and, under an agreement dated March 17th, 1902, they granted a subsidy of £16,000 for the establishment of a large station at Cape Breton, Nova Scotia. This station was completed before the end of 1902, and on December 18th in that year wireless messages were despatched by Senatore Marconi and the Earl Minto from Cape Breton to His Majesty King Edward VII. Senatore Marconi also sent a message to King Victor of Italy.

In the meantime Poldhu station had been equipped with a new transmitting aerial, supported on four wooden lattice towers, each 215 feet high and arranged about 200 feet apart on the four corners of a square. The aerial, consisting of about 100 wires in the form of an inverted pyramid, was suspended from insulated steel stays stretched between the tops of the towers. Similar towers and aerials were erected at the Glace Bay and Cape Cod stations. Subsequently each of the wires in the Poldhu aerial was furnished with a nearly horizontal extension, and thus the aerial became of the now well-known "umbrella" type. Owing to the increased length and greater electrical capacity of these aerials, as compared with the earlier "fan" aerial, their natural wavelength was greatly increased, and they enabled an increased transmitting power to be effectively employed.

The Glace Bay station had, in the first place, been equipped with a 100 h.p. transmitting plant, and in 1903 a new 100 h.p. steam-driven alternator set was installed at Poldhu, the original 32 h.p. oil-driven plant being retained as an emergency set. Towards the end of 1902 the Poldhu transmitting circuits had been rearranged in accordance with the diagram in Fig. 2. The secondary spark circuit, containing S_2, C_2 and J_2 (Fig. 1) was done away with and the aerial and earth were connected to the secondary winding of the jigger J. Two high-tension choking coils, CH_1 and CH_2 (Fig. 2), were inserted in the secondary circuit of the transformer T. These choking coils had open iron circuits and the magnetic density in the iron and the current density in the copper were kept low in order to minimise the losses in the circuit. By this means a voltage of about 100,000 was obtained across the condenser C with an impressed voltage (alternator voltage × transformer ratio) of about 8,000. The capacity of C was about 0·2 microfarad and the spark gap S during the full power trials was 5·5 cm. The signalling switch SS was connected across the condenser C through the two coils S CH. With the signalling switch closed, the voltage in the circuit was equal to that of the alternator multiplied by the transformer ratio, and this caused a relatively small wattless current to flow through the circuit. When the switch was opened the condenser became charged to its proper working voltage and discharged across the spark gap. This signalling device was capable of manipulating the circuit at ordinary telegraphic hand speeds, with a signalling load of 50 or 60 kW.

In this connection it is of interest to note that, in the leading article in the *Electrician* of January 17th, 1902, from which we have previously quoted in another connection, the opinion is stated in all solemnity that—" The enormous power used for that long distance will probably make it impossible to send more than four, or at most five, words per minute. . . ."

There can be no doubt, however, that the attitude adopted by the electrical press, and others, at that time was inspired by a fear that the interests of the cable companies would be adversely affected by the success of Senatore Marconi's work.

The increased wavelength and power employed in the transmitters enabled the stations to communicate satisfactorily across the Atlantic for the greater part of each day during the winter months, and for shorter periods during the summer. From the latter half of 1903 and onwards the stations were employed on long-distance transmission of news and private messages to ships crossing the Atlantic. The first two ships to be fitted with special receiving apparatus for this work were the *Lucania* and *Campania*, belonging to the Cunard Steamship Company. The service was greatly appreciated by the passengers, and subsequently was shared by a large number of other passenger vessels.

The experience gained during the years 1902 and 1904 with the long-distance stations proved definitely that, in order to establish a commercially successful wireless telegraph service across the Atlantic, larger powers and longer waves than those hitherto employed would be required. On the other hand, it had been found that the use of larger aerials and greater wavelengths had a tendency to increase the trouble caused by the atmospheric disturbances commonly known as " strays " or " X's." Since the introduction of the magnetic detector, the use of the coherer and Morse inker had been abandoned for long-distance work, and the signals were received by ear from a telephone connected across the secondary coil of the magnetic detector. The sounds produced in the telephone by the " X's " were frequently much louder than those produced by the signals. Even when the " X's " were only of the same strength as the signals they were generally indistinguishable from the latter, and thus marred the proper reception of the messages.

In order to overcome this difficulty Senatore Marconi conceived the idea of greatly increasing the spark frequency of the transmitter, so as to raise the pitch of the note produced in the telephone To this end he devised his well-known disc discharger, which consists essentially of a steel disc

about 4 feet in diameter, on the rim of which a number of copper studs are fixed. When the disc is revolved, the studs pass in succession between two slowly-revolving copper discs, which are connected to the condenser circuit in place of the ordinary spark gap (see Fig. 3). In this way a regular series of condenser discharges is obtained, and the spark frequency can be altered at will by varying either the speed of rotation of the steel disc or the number of studs in its rim. Such a transmitter will produce a musical note in the telephone of the receiver, which can readily be distinguished from the noises produced by the "X's" or from the signals of other transmitting stations. A further advantage obtained by the employment of these revolving disc dischargers is that the damping in the condenser discharge circuit is greatly reduced. Each discharge of the condenser commences when a moving stud approaches the two copper disc electrodes. The actual length of the gap between the stud and the disc electrodes at the moment the discharge commences depends upon the voltage to which the condenser is charged, but during the discharge the gap becomes progressively shortened by the movement of the stud. Thus the damping due to the resistance of the spark gap is greatly reduced.

Another notable step in the early history of the development of long-distance wireless telegraphy was the discovery, made early in 1905, by Senatore Marconi that the radiation from a horizontal aerial, one end of which is earthed, is greatest in the direction away from the free or unearthed end. The natural corollary to this is that an aerial of this type, when used for receiving, will best absorb radiation from the direction in which it radiates most when used as a transmitter.

Early in the year 1905 Senatore Marconi put in hand the plans for the erection and equipment of a new high-power station, with a view to establishing a regular commercial service across the Atlantic. A site was chosen for this station at Clifden, County Galway, and work was started on the site in October, 1905. The equipment of this station was on the same lines as that of the Poldhu and Glace Bay stations, except that the power of the transmitter was increased to 300 kW and a horizontal directional aerial was employed. A notable departure from the earlier practice was the employment of an air condenser in place of the usual glass plate condenser, the maintenance of which had proved very expensive on account of the frequent breakages which occurred. The building in which this condenser was housed measured 350 feet in length and 75 feet in breadth, and the height at the eaves was 33 feet. The condenser itself consisted of 1,800 galvanised steel sheets, each measuring 30 feet by 12 feet, suspended from the roof ties of the building by porcelain rod insulators. The dielectric space between the sheets was 12 inches wide, and the total capacity was 1·8 microfarads. The dielectric losses in the condenser were found to be very small, as compared with those of the glass condensers hitherto employed, with the result that the damping of the primary oscillating circuit in the Clifden transmitter was correspondingly reduced. The condenser was tested up to fully 150,000 volts in conjunction with a spark discharger having a 6 cm gap between zinc spheres 6 inches in diameter. The air concussion occasioned by such a high potential discharge of so large a capacity was naturally terrific, and the magnitude of the discharge current was so great that when the spark was left running continuously for a few seconds the zinc spheres melted.

In the design of the station provision had been made for the installation of Senatore Marconi's new disc dischargers. The delivery of these machines, however, became delayed, and the preliminary tests of the station were carried out with a fixed spark gap, which, with maximum transmitting power, consisted of two gaps in series, each 3 cm in length. The signalling circuit was the same as that employed at Poldhu (see Fig. 2), but the signalling switch was electromagnetically operated.

When the disc dischargers were installed, they were arranged to give a spark frequency of about 350 per second. Under these conditions it was

necessary to reduce as much as possible the time period of the condenser charging circuit, since the time available for each combined charge and discharge of the condenser was now not more than 1/350th of a second. To this end the two choking coils CH_1 and CH_2 (Fig. 2) were removed from the circuit and others of comparatively small inductance and having no iron cores were substituted for them (see Fig. 3).

The above-mentioned change necessitated the employment of other means for signalling than that shown in Fig. 2. Because of the low value of the inductance in the charging circuit, the idle current through the signalling switch when the latter was closed became greater than the normal working current. The switch consequently " flared " and caused the signalling to be slow and faulty.

The method of signalling that was finally adopted is illustrated in Fig. 3. The two signalling switches SS_1 and SS_2 are placed in the transformer secondary circuit, and when open they completely interrupt the condenser-charging current. A low-pressure air blast at each of the switch contacts extinguishes the arc that tends to form at the moment the switches open. This method of keying the circuit proved very satisfactory, and was subsequently developed to the extent that signalling speeds up to 85 words per minute were attained on full power.

The introduction of the disc discharger proved to be one of the most important steps in the early development of long-distance wireless telegraphy. The reception of signals during times when " X's " were prevalent was made very much easier, since the musical note of the signals was quite readily distinguishable from the sounds produced by the " X's." A further and important advantage obtained by the use of the new discharger was that the maximum potentials in the transmitting circuits and aerial were very much lower for a given power.

The aerial system at the Clifden station is of the horizontal directional type, consisting of thirty wires supported by twelve wooden masts, each about 210 feet high. The width of the aerial at the end nearest to the condenser house (in which the transmitter is situated) is about 700 feet, and at the far end about 1,150 feet. The total length of the aerial from the " leading in " insulator is about 2,100 feet.

The earth system originally consisted of two sheets of heavy copper gauze, each 4 feet wide and 600 feet long, buried in the ground in line with the aerial, but running in the opposite direction. For about 200 feet of their length the copper gauze earth strips were laid at the bottom of a lake situated about 400 feet away from the transmitting house, and whose area is about 10 acres. Under the aerial and running the full length of the latter were a number of galvanized iron wires buried in the earth and connected to the steel frame of the condenser house. The frame of the condenser house was also connected to the two copper gauze strips.

Whilst the Clifden station was being built the station at Glace Bay was removed to a larger site, and re-equipped with a transmitting plant and aerial similar to that installed at Clifden, and it was by means of these two stations that a limited public service was inaugurated on October 17th, 1907, and this service was made available to the general public on February 3rd, 1908.

The experience acquired at Clifden prior to the opening of the public service and during the first year or so of that service was extremely valuable, and led to many important improvements in the details of both the transmitters and receivers. The magnetic detector was considerably improved, and instead of being connected directly to the aerial circuit, was employed in a weakly-coupled secondary circuit. Later on the magnetic detector was replaced by a new type of receiver devised by Senatore Marconi, in which a Fleming valve was employed as a rectifier. Later on this was superseded by the carborundum crystal receiver.

The receiving aerial originally employed at Clifden consisted of two wires, each about 2,100 feet long, supported on the tops of the masts of the transmitting aerial. Subsequently these were replaced by four wires, each 4,000 feet long, and the average strength of the received signals was greatly increased thereby. A large measure of success in eliminating the effects of

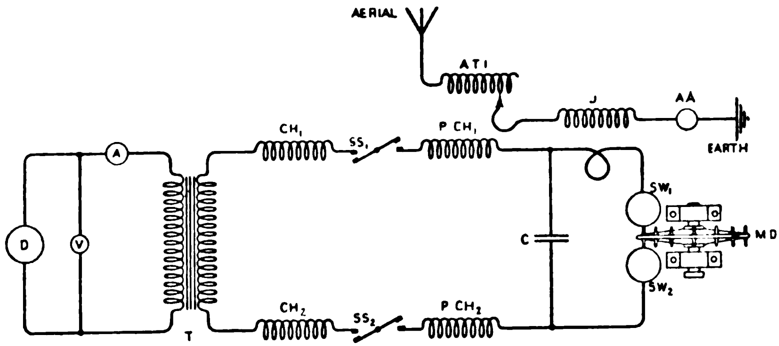


Fig. 3.

atmospherics was obtained by the employment of two balanced circuits in the receiver. One of these circuits was tuned to the wavelength being received and the other was tuned to some other wavelength. The signals came through on the former circuit only, whilst the atmospherics affected both circuits equally and the effects could be neutralised by opposing them.

With a view to improving the clarity of the tone of the signals, Senatore Marconi experimented with the use of high-tension direct current for charging the transmitting condenser. These experiments were very successful, and in 1909 both stations were equipped with high-tension direct current generators and a 12,000 volt storage battery consisting of 6,000 cells of 30 ampere-hours capacity. Four high-tension direct current dynamos, each with an output of 10 amperes at 5,000 volts, were installed at each station for charging the batteries. Three of the dynamos were connected in series for this purpose, the fourth being a spare. Single-phase motors supplied with current from the 300 kW alternator were used for driving the direct current dynamos, and, during transmission, the battery and dynamos were usually paralleled. When the traffic was light the transmitter could be worked for several hours from the battery alone, and this had the effect of improving the load factor of the plant. After conversion to direct current working the transmitting power in the aerial was about 80 kW and the dynamo to aerial efficiency was about 50 per cent. The plant remained in satisfactory operation at Clifden until the end of 1920, when a large valve transmitter was installed. The original high-tension dynamos and battery are now used for supplying the current required for working the new valve transmitter.

Recent developments in the art of wireless telegraphy have lead to the general employment of continuous or undamped waves, but it is hardly within the scope of this article to deal with these developments. The "Early History of Long Distance Wireless Telegraphy" might very appropriately be made to finish with the establishment of a commercial transatlantic service in February, 1908, but a reference here to the early work of Senatore Marconi in connection with transmitters for producing continuous waves is not out of place.

The idea of employing high-frequency alternators for the transatlantic work was suggested by Senatore Marconi in 1902, when it was first realised that comparatively long waves would have to be employed ; but no suitable

alternators were available in those days, neither did there appear to be any prospect of getting such machines designed and manufactured. The invention by Poulsen, in 1903, of the arc type of high-frequency generator opened up definite prospects with regard to the employment of continuous waves for wireless telegraphy. For several years, however, very little progress was made in this direction. The early types of arc generators were inefficient and unreliable and difficulty was experienced in finding a suitable and efficient receiver for continuous oscillations.

In 1907 Senatore Marconi produced a form of continuous wave transmitter (see Fig. 4) consisting of a large metal disc A capable of being rotated at high speed, and two smaller discs C, C, which could also be rotated at high speed, placed very close to the edge of the large disc A and arranged in a plane at right angles to that of the large disc. The two smaller discs C, C, are connected through brushes to the outer terminals of the two condensers K, which are joined in series and charged through suitable inductive resistances I, I, by a high-tension continuous current dynamo H. The middle point of the two condensers K is connected to the disc A through the oscillating circuit containing the condenser E and the primary coil of the oscillating transformer F. If the discs are rotated at a sufficiently high speed and a sufficiently high electromotive force is applied across the condensers, oscillating discharges will take place between the edge of the large disc and the two smaller ones and oscillations will be set up in the circuit E, F.

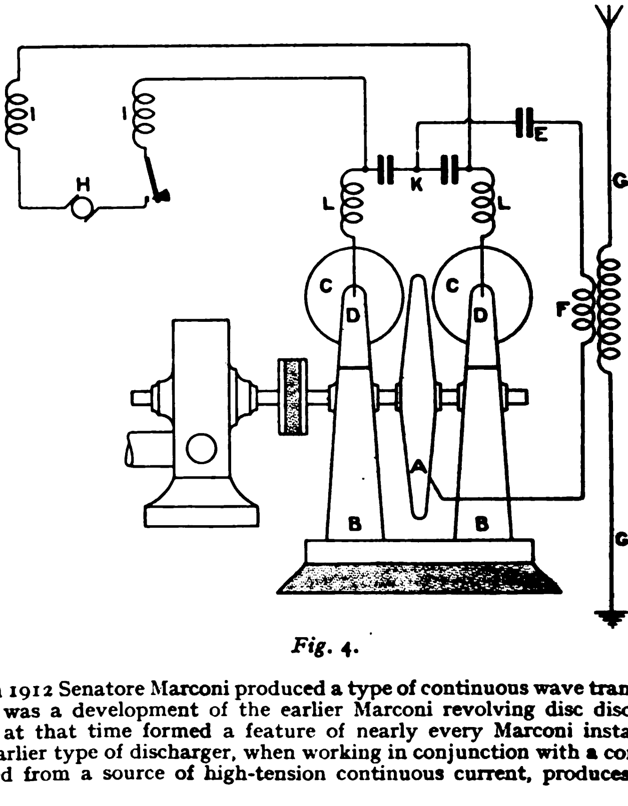


Fig. 4.

In 1912 Senatore Marconi produced a type of continuous wave transmitter which was a development of the earlier Marconi revolving disc discharger, which at that time formed a feature of nearly every Marconi installation. This earlier type of discharger, when working in conjunction with a condenser charged from a source of high-tension continuous current, produces in the

aerial a series of equally spaced groups of secondary oscillations. If the spark frequency of such a discharger be gradually increased, the time interval separating the end of one group of secondary oscillations from the beginning of the next one will gradually decrease, and a point will be reached at which the successive groups begin to overlap each other. If the phase relation between the overlapping groups is suitably timed, the oscillations in the aerial will become continuous, but they will vary in amplitude. The variation of amplitude will, however, decrease as the primary spark frequency is further increased, and by employing a suitably high spark frequency, continuous oscillations of constant amplitude can be produced in the aerial.

In order to obtain the correct phase relation of the successive groups it is necessary to ensure great accuracy in the spacing of the studs on the rim of the disc. The studs must also travel at a very high velocity. The higher the frequency of the oscillating circuits, the higher must be the stud velocity for a given degree of accuracy in the tuning. It is also necessary to keep the speed of the disc constant within very narrow limits, and the speed must be such that the interval between the beginning of each discharge is equal to the period of oscillation of the aerial or an exact multiple of that period. In practice it was found that all the above-mentioned conditions could be fulfilled when dealing with small powers in the circuits. When an attempt was made to increase the power to more than a few kilowatts the studs and side electrodes burnt too rapidly to allow the necessary accuracy of timing to be maintained. In order to overcome this difficulty, the timing of the discharges of the main condenser was arranged to be controlled by a timing or " trigger " disc. To this end the gaps between the studs and the side electrodes of the revolving discharger are set at such a length that the condenser cannot discharge across them until they are ionized by a small spark, which is provided at the correct instant by the " trigger " disc circuits.

The working of a transmitter of this type was demonstrated early in 1913 to the British Government Committee that was appointed to report on the merits of the then existing systems of long-distance wireless telegraphy. In their report, dated April 30th, 1913, this Committee stated :—

" The only continuous high-frequency generator we have yet seen tried with success over long distances is the Marconi continuous high-frequency machine, to which we have already referred. For the purpose of witnessing transatlantic experiments with this machine we paid a second visit to Clifden, and experiments were made with it in our presence. Using it, Mr. Marconi on the 26th and 27th of April, 1913, sent from Clifden to Glace Bay messages prepared by us for the purpose, such messages being at our request at once repeated from Glace Bay by means of the Company's ordinary plant and correctly received at Clifden. The power put into the aerial by this machine for the purpose of the experiments was not sufficient for commercial purposes, but there seems no reason why higher power should not be obtained."

During the demonstrations on the 26th and 27th of April, 1913, the power supplied to the aerial by the continuous wave transmitter was about 20 kW. A larger transmitter of the same type was tested at the Marconi Company's Carnarvon station, in 1914, when a power of 60 kW was obtained in the aerial. The Marconi transatlantic stations at Carnarvon, North Wales, Stavanger, Norway, and New Jersey, U.S.A., were equipped later on with continuous wave transmitters of the same type, capable of a high-frequency output of 200 kW.

In Fig. 5 is shown a diagram of the arrangement of the discs and circuits of the continuous wave transmitters that were installed at Carnarvon.

Referring to the diagram (Fig. 5), the H.T. D.C. generator has a voltage of 5,000, and charges the three condensers C_1 C_2 and T P C through suitable inductances and limiting resistances. The trigger disc T D carries on its rim twice as many studs as there are on each of the main discs M D_1 and M D_2. The trigger disc discharges the condenser T P C, and at each discharge of T P C the trigger secondary condenser T S C discharges across the gap T S G. With the main disc M D_1 and M D_2 in the position shown in the

diagram the discharge of T S C will cause ionizing sparks to occur between all four of the upper electrodes and the studs on M D_1 and M D_2 which are opposite to them. By the time the next trigger discharge occurs the discs M D_1 and M D_2 will have moved to such a position that two studs on each

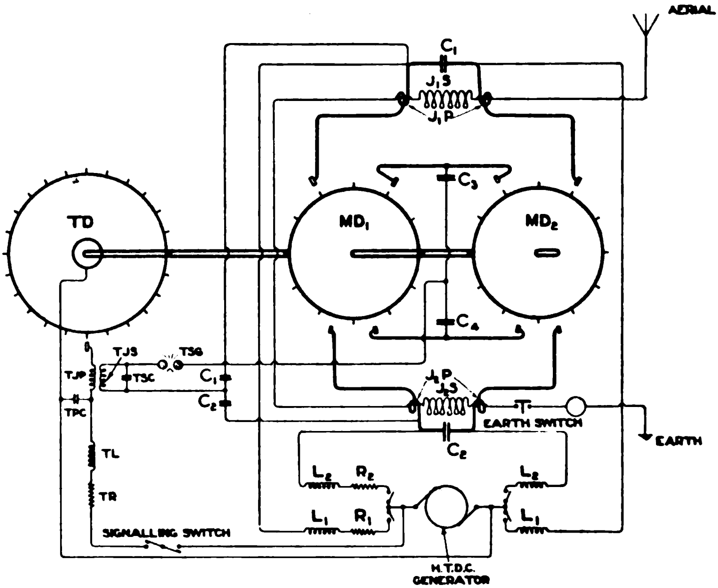


Fig. 5.

will be opposite the four lower electrodes and the discharge of T S C will cause ionizing sparks to occur between the four lower electrodes and the studs on the discs. The frequency of the discharge circuit of T S C is made as great as possible, and it may be perhaps fifty times as great as that of the main circuits.

The condenser C_1 discharges through the primary winding J_1 P, and the four upper spark gaps on the main discs. Condenser C_2 discharges through the other primary winding J_2 P and the lower four spark gaps on the main discs. The primary windings of the main jiggers J_1 P and J_2 P are each in two halves with the condenser connected between them. This ensures the ionizing of all four of the main gaps when the trigger discharges take place. The side electrodes of M D_1 and M D_2 are arranged so that the condensers C_1 and C_2 are discharged alternately. The secondary windings of the two jiggers are connected in series in the aerial circuit.

The timing of the trigger discharges is set so that the main discharge does not take place until the studs on the main discs are right opposite the side electrodes. As the studs move away from the side electrodes the discharge is rapidly quenched by the lengthening of the gaps and the quenching is further assisted by high-pressure air blasts from four nozzles, mounted one on each of the side electrodes. A tight coupling, about 10 per cent., is employed between each primary circuit and the aerial, and the quenching of the primary discharge, as soon as the energy has been transferred to the aerial circuit, prevents reaction between the primary and aerial circuits.

Fig. 6 shows diagrammatically the oscillations (*a*) in the trigger circuit, (*b*) and (*c*) in the two primary circuits, and (*d*) in the aerial.

The velocity of the trigger stud tips is about 200 metres per second, and as the wavelength of the Carnarvon station is 14,000 metres, the distance through which a trigger stud travels during one oscillation is 9·4 mm. This distance is great enough to ensure that any error in the timing, due to irregular burning away of the tips of the trigger studs, will be negligible.

At Carnarvon the timed spark transmitters were capable of putting 200 kW into the aerial with an efficiency of about 67 per cent. Under normal working conditions the aerial input was 150 kW, and this was obtained with an output of 225 kW from the high-tension direct current machines. The signalling was effected by interrupting the charging current of the trigger primary condenser. As this current was only about 0·3 of an ampere at 5,000 volts, signalling speeds of over 100 words per minute were readily obtained.

The signalling switches were capable of operating the transmitter at full power at any speed up to 200 words per minute without any blurring of the signals being detected at short range, but at the maximum range such speeds could not be employed. The reason for this is that at very high speeds the transient period during which the current amplitude in the transmitting aerial is growing under the action of the primary discharges, forms a large proportion of, or may even become greater than, the period occupied by a Morse dot. Thus, at very high speeds, the current amplitude in the transmitting aerial does not reach the same value during a dot that it attains during a dash. The resulting disparity between the strength of the received dots as compared with that of the dashes is accentuated by

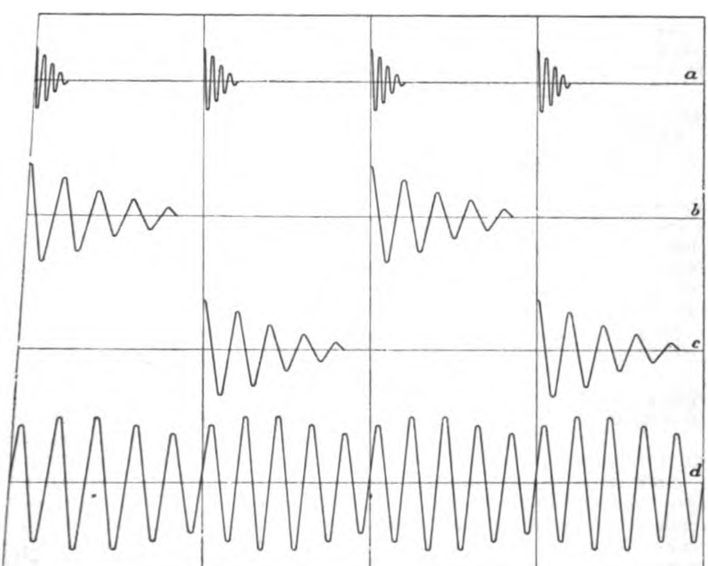


Fig. 6.

similar conditions which exist in the receiver, where the current amplitude in the receiving aerial gradually grows under the E.M.F. impressed by the signal.

It is probable that at the time these large Marconi continuous wave transmitters were introduced for transatlantic work they were the only transmitters of either the damped or continuous wave type which were capable of being operated at speeds above 100 words per minute with a power of 200 kW in the aerial. They formed the connecting link between the damped wave spark transmitters and the more modern continuous wave transmitters, such as the high-frequency alternator and the thermionic transmitting valve.

At the present time a great army of workers is employed in further developing and perfecting the art of long-distance wireless telegraphy and telephony, and in elucidating the many still unsolved problems associated with the propagation of electromagnetic waves round the earth. The initiative in all this work was taken by Senatore Marconi, when, in the year 1900, he started on his self-appointed task of signalling across the Atlantic. When one takes into consideration the embryonic state of the art of that date, and the magnitude of the task undertaken, one can only marvel at the rapidity with which Senatore Marconi scored his initial success and afterwards developed it to a stage where it became of world-wide importance.

THE RECTIFICATION EFFECT IN ITS RELATION TO THE COMPOSITION AND STRUCTURE OF CRYSTALS.

By H. M. Dowsett, M.I.E.E., F.Inst.P.

In the *Radio Review* for November, 1921, the author has shown that all the experimental evidence indicated that the rectification effect of carborundum is due to its particular crystal structure.

This conclusion derives additional support from the fact that no current whatever flows through a good rectifying point of green positive carborundum within the range of applied EMF + 0·2 volts to − 2.0 volts or through a good rectifying point of black negative carborundum within a similar range of − 0·2 volts to + 2·0 volts, the crystal under such conditions behaving like a perfect insulator so that no thermo-electric effects can take place until this range, which is asymmetric as regards zero, is exceeded. But it is this asymmetry which produces the rectification effect. Also it is clear that the limiting values of this range are of an order that no electrostatic, polarisation, or photoelectric effect could account for. These other effects all modify the shape of the characteristic to some extent and in varying degrees, but with carborundum their influence is so subordinate to that of crystal structure that it may be neglected.

But in the case of mineral rectifiers such as molybdenite which conduct for the smallest applied EMF, the thermo-electric, polarisation and every other effect must play a much larger part than with carborundum, and it is more necessary to demonstrate that it is the composition and structure of the crystal itself which are the determining factors in rectification.

In the first place, G. W. Pierce* has shown as the result of much careful experimental work that the thermo-electric effects associated with molybdenite although very pronounced, do not produce sufficient heat to account for the rectification effect.

In the second place, the examination of carborundum previously referred to showed that one form of crystal structure—the tabular hexagonal green variety—always rectified in the positive sense, and that a very different form of crystal structure—the flake hexagonal black variety—always rectified in the negative sense; in the first case the base of the crystal had to be connected to the positive pole of the battery, in the second case to the negative pole in order to obtain the greatest current for a given applied EMF.

This association of crystal structure with a definite direction of rectification is a fact of some importance.

There is a grade of carborundum in which both positive and negative rectification are found, but in this case the crystal structure is not homogeneous, it is graphitic and contains more impurities.

Now in molybdenite the rectification effect varies in degree, but it always has the same sense. Thus Figs. 1 (*a*), (*b*) and (*c*), redrawn from Figs. 125, 126, 127 in Prof. Pierce's book shows the characteristics of negative crystals, Fig. 2 gives a number of characteristics of molybdenite detectors which came under the observation of the writer in 1916, all of which are negative, and Fig. 3 shows some characteristics taken recently, again all negative.

Molybdenite is a rare mineral, and it has therefore not been possible to examine large quantities of it as was done with carborundum, but the

* "Principles of Wireless Telegraphy." By Prof. G. W. Pierce. (*McGraw-Hill Publishing Co., Ltd.*; 1910. Page 198.)

evidence appears to be sufficient to show that molybdenite which has but one crystal form—a hexagonal flake, sometimes foliated, the flakes occasionally

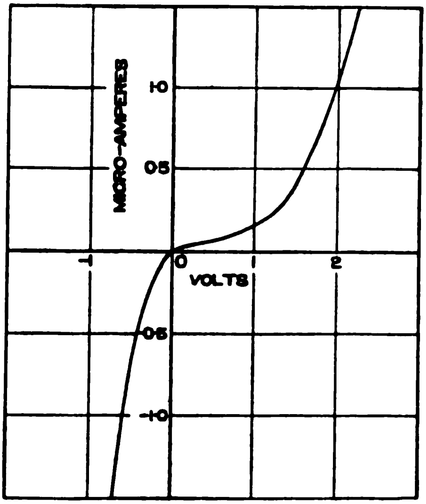


Fig. 1(*a*).

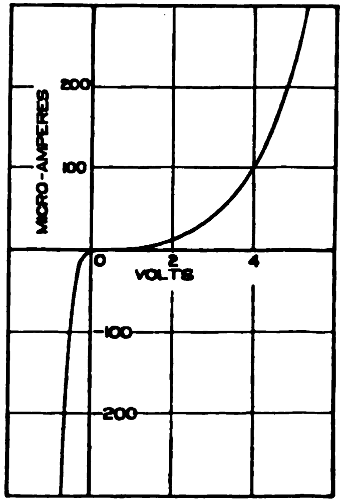


Fig. 1(*b*).

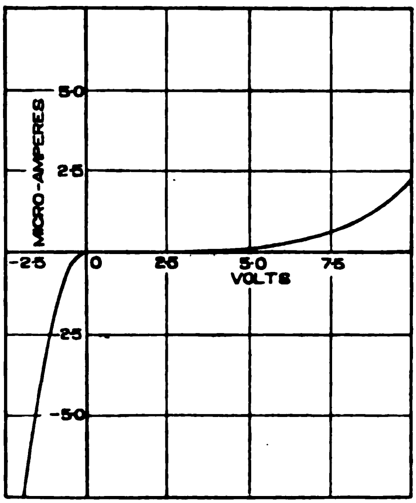


Fig. 1(*c*).

Figs. 1(*a*), 1(*b*) *and* 1(*c*).—*Characteristic Curves for Molybdenite* (*G. W. Pierce*).

but very rarely forming hexagonal prisms—rectifies correspondingly in one direction only for all crystals.

The chemical formula for molybdenite is **MoS_2**, its atomic arrangement being **S=Mo=S**. Thus a positive element is held by two negative

elements, and most probably between them, a grouping which one might reasonably expect to have some influence in imparting an electro-negative character to the crystal structure. No doubt the atomic arrangement does exist in this respect in the case of molybdenite, although, as illustrated later on, by the behaviour of some other crystals of similar chemical formula, the position of the positive element in the molecule does not by itself determine whether the crystal shall show a positive reaction or a negative. Thus the evidence provided by molybdenite alone is confirmatory, but not conclusive as to the part played by crystal structure and composition.

Let us now examine the crystals of some other minerals.

Galena, **PbS** for example, crystallises in cubes and octahedrons and shapes developed from these two forms. All the samples tested on a recent occasion ossessed what is usually called a rising characteristic, but none of them

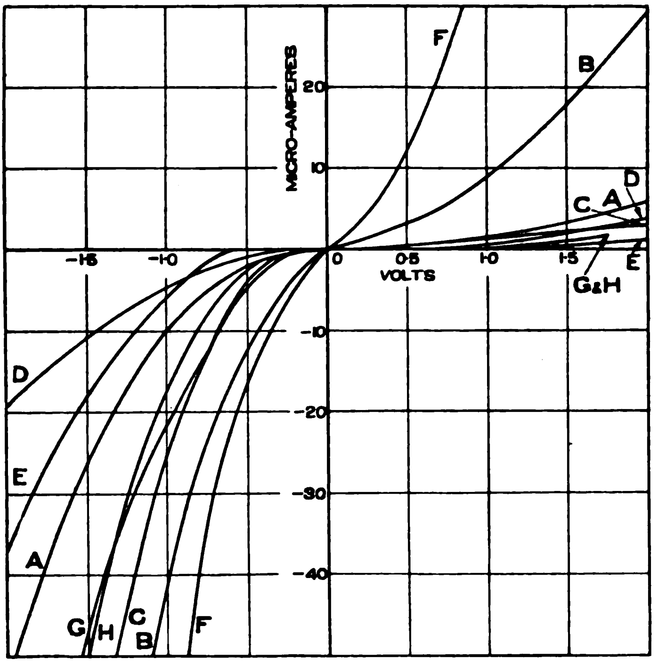


Fig. 2.—Characteristic Curves of Molybdenite.

Specimens A, B, C, mounted in "Wood's Alloy."
Specimens D, E, F, G, mounted on upper surface only with "Wood's Alloy."
Specimen H mounted in special screwed cap.

rectified—that is, the slope of the curve at every point on the positive side of zero EMF was identical with the slope on the negative side. Fig. 4 gives a typical characteristic of about 30 samples. As a rectifier then galena has a neutral character.

Iron Pyrites **FeS$_2$** also crystallises in cubes, but with striated faces and in octahedrons. The characteristics of two distinct varieties, one of them having a bright highly polished appearance, the other being a dull crystal, are given in Fig. 5 and Fig. 6. These crystals all show positive rectification, but not of a pronounced order. It will be noted that the atomic arrangement is similar to that of molybdenite.

The characteristics of samples of Iron Sulphide Fe_7S_8, Fig. 7—which usually occurs in irregular masses and very rarely in hexagonal crystals—are similar to the above but of higher resistance.

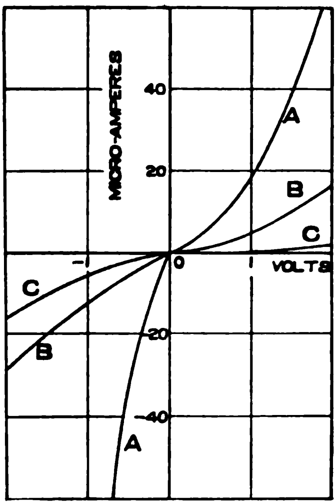


Fig. 3.—Characteristic Curves of Molybdenite.

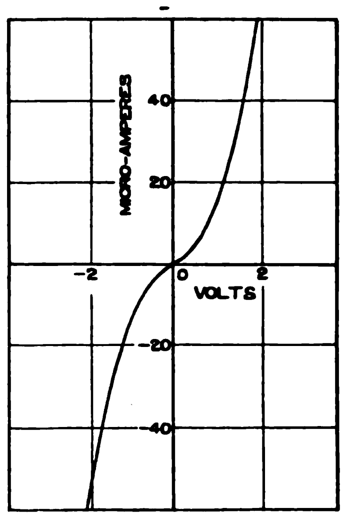


Fig. 4.—Typical Characteristic Curve for Galena.

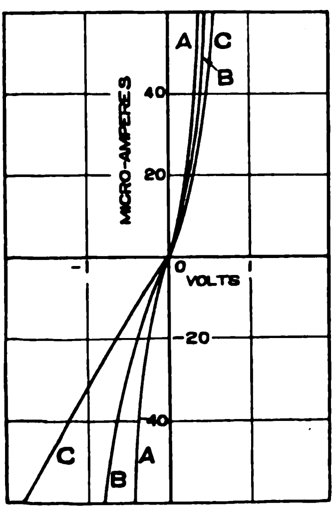
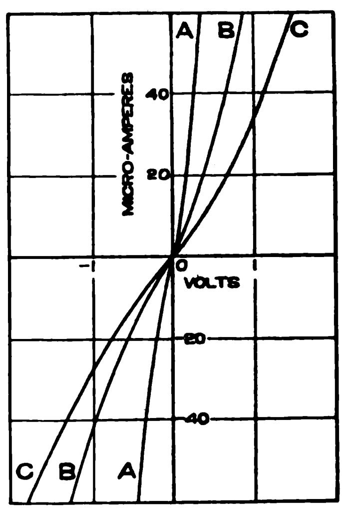


Fig. 5.—Characteristic Curves for Bright Iron Pyrites.



Characteristic Curves for Rough Iron Pyrites.

As a final example we may take Zincite, **ZnO**, which crystallises in the hexagonal form. Crystals of this mineral are consistently and decidedly positive, as shown in Fig. 8.

Thus molybdenite is the most negative of the crystals named, galena is neutral, iron pyrites is feebly positive, and zincite is decidedly positive, *and this is the same order in which the corresponding metals molybdenum, lead, iron, and zinc occur in the electro-chemical table of the elements.*

The rectification effect, therefore, so far as it concerns the relative strengths of the two currents which under the influence of a given EMF can be made to flow through sensitive points on the crystals mentioned, first in one direction and then in the other, clearly depends on the electro-chemical nature of the positive ions in the compounds. Having established this point, the dependence of the rectification effect on crystal structure is also established as the actual position of these positive ions must also be of importance.

It has been shown in the case of carborundum that it is only the position of the surface ions which matter, as the electrostatic and magnetic fields of all the interior molecules forming the crystal hold them in a rigid, though elastic state. The outer molecules must possess more freedom than the inner ones and all we need to assume is that each molecule possesses a conducting

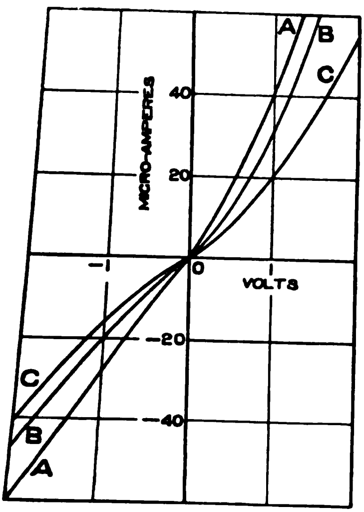


Fig. 7.—Characteristic Curves of Iron Sulphide.

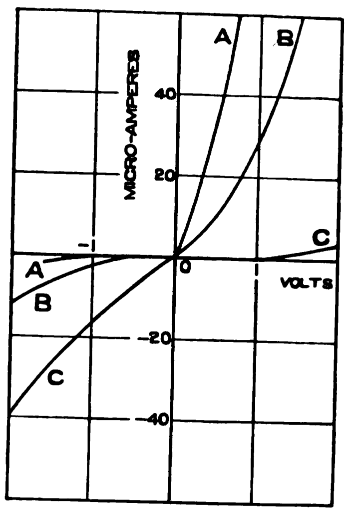


Fig. 8.—Characteristic Curves for Zincite.

axis, and that the applied electrostatic field reacts with the internal fields to produce an axial distortion in the outer molecules which improves conductivity and gives the crystal its rising characteristic. The carborundum molecule would appear to have its conducting axis parallel to the crystal face, as the crystal is a perfect insulator for low values of applied EMF, but as a current flows with minimum applied EMF through the rectifying points of all the minerals we have now discussed, the molecular axis in each case must already be inclined at some angle to the crystal face, and the applied EMF increases this inclination until that stage is reached at which the characteristic assumes a straight line character.

A wide area contact over a broken surface provides paths at all angles into the crystal network, molecular distortion is then unnecessary, and therefore no rectification effect results.

PATENT SECTION

(A) Valve Patents during 1921.

(B) British Patent Specifications.

(C) Name Index to British Patents.

(D) U.S.A. Patent Specifications.

(E) Name Index to U.S.A. Patents.

VALVE PATENTS FOR 1921

No. **137,271.** By E. H. Armstrong.

In order to obtain a satisfactory effect from a detector it is necessary that the strength of the signal should not fall below a certain value, otherwise the response of the detector is so feeble that even with the assistance of L.F. amplifiers the signals cannot be made readable. The only remedy, therefore, in the case of weak signals is to apply H.F. amplification. However, this can be carried out efficiently only if the wave is not too short. For frequencies corresponding to a wavelength of about 100 metres the internal capacity of the valve acts as a shunt of comparatively low impedance, and therefore amplification becomes almost impossible. Obviously the difficulty would be overcome if we could manage to convert a short wave into a longer one, for which efficient amplification can be carried out. According to the invention, this reduction of the frequency is obtained by heterodyning in one or several stages.

An arrangement of circuits for this purpose is shown in Fig. 1. Suppose the oscillations arriving at 31 are of a frequency 10,000,000. They are passed on to circuit 32–33 tuned to this frequency and combined with the oscillations produced by a local generator 34 of a frequency 11,000,000. After rectification by detector 35, a frequency 1,000,000 is obtained. This is amplified by 38, and then combined with a frequency of 1,100,000 produced by the local generator 40. After rectification a frequency 100,000 is obtained, which is amplified by 43. The last current is rectified and indicated by 44 and 45 respectively.

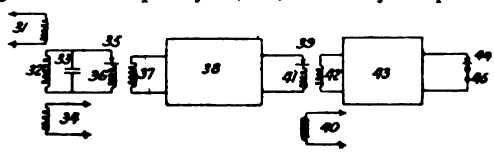


Fig. 1.

No. **139,494.** By M. I. Pupin.

It is well known that the amount of amplification, especially in the case of high frequency, is limited by the internal disturbances in the tube (besides other causes), mainly due to the unsteadiness of the current during operation. The disturbances which are of a comparatively low frequency are amplified, and render the operation of the amplifying system unsatisfactory if the number of valves exceeds a certain limit.

In order to overcome this difficulty, it is proposed to split up the system into sections, each of which contains only three or four valves, connected in cascade in any manner. The sections are interconnected by a conductor, consisting of capacities and resistances, or of resistances and inductances. Such a conductor is illustrated in Fig. 2 by 23, 24, 25, 26, 27, 28, 29. By a

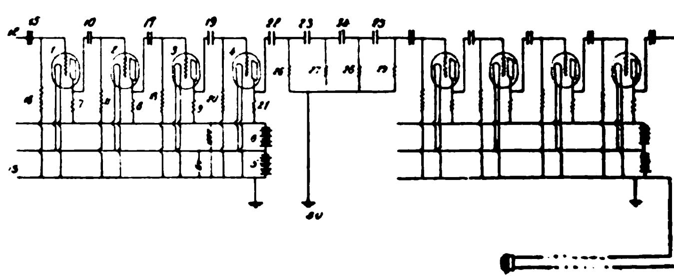


Fig. 2.

proper choice of the elements of the compound conductor (or, as it is called in the specification, "pilot-conductor"), the attenuation for H.F. currents will be very much smaller than for L.F. currents. It follows that while the H.F. oscillations are handed on from one section of amplifiers to the next without being weakened to any noticeable degree, the low frequency disturbances are almost entirely eliminated by the "pilot-conductor."

No. **139,514.** By Westinghouse Lamp Company (assigned by H. C. Rentschler).

Consider the three-electrode valve (Fig. 5) filled, say, with argon (or with certain metallic vapours) at a pressure which may be anything between a fraction of a millimeter and several millimeters of Hg. The filament 5 is heated to emit electrons. The screen 6 is kept at a positive potential. The electrons move towards the screen and, on their way, come into collision with the gas particles. The result of this impact will depend on the velocity of the electrons at the moment when the collision takes place. All other conditions being given, there is a definite critical speed at which the impact becomes non-elastic, that is to say, after the impact the velocity of the original electron becomes greatly reduced, while the secondary electrons, which may be produced, are also of a small velocity. At velocities smaller than the critical, the electron shoots through the gas particles or rebounds from them as in the case of elastic impact, maintaining its original speed.

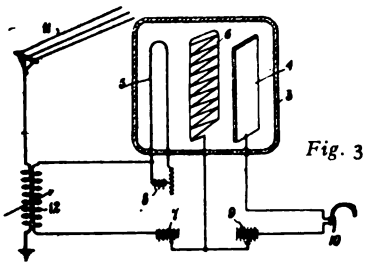


Fig. 3.

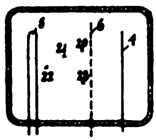


Fig. 5.

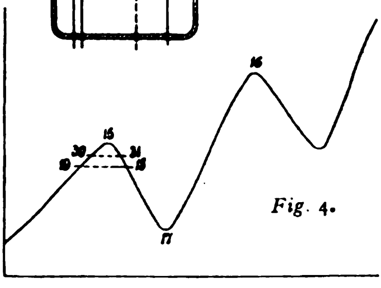


Fig. 4.

Let us now assume that the screen is kept at a rather low positive potential. The acceleration of an electron starting from the filament will be small and its velocity, when near the screen, will still be less than the critical, but at the same time will be high enough to reach, in the event of its escaping through the mesh, the plate, notwithstanding the fact that the latter is kept at a potential negative relatively to the screen. If we now increase the screen potential, it is possible that the velocity of the electron will reach the critical value just before it arrives at the screen, say, at a point 20. As explained before, electrons with a small velocity will be produced, which will be absorbed by the screen, since the negative potential of the plate is sufficient at such small velocities to repel them back to the screen. If the screen potential is increased further, the critical velocity will be reached at a point more distant from the screen, say, at 21. In this case, the slowly-moving electrons resulting from the impact may acquire, by the time they arrive at the screen, a velocity sufficiently high to overcome the repulsion of the plate, and thus reach the latter. At a still higher screen potential, the electrons may reach the critical velocity when quite near the filament, say, at a point 22. By the time the electrons, which start after the impact with a small velocity from 22, arrive near the screen, say, at a point 23, they may again reach the critical velocity. The electrons produced after

the second non-elastic impact, even if they escape through the mesh, are repelled back to the screen by the plate, owing to their small velocity. With a higher screen-potential, the second non-elastic impact will take place farther from the screen, so that the electrons will have again recovered their speed by the time they arrive at the screen, and will therefore reach the plate. A further increase of the screen may lead to three non-elastic impacts between filament and screen, and so on.

It will be seen that the number of electrons reaching the plate (and thus the plate current) will at first increase with the increase of the screen potential. At a certain value of the latter a maximum will be reached. On the further increase of the screen potential, non-elastic impacts near the screen begin to take place, and the current diminishes until a minimum is reached. If the screen potential is further increased, the current begins to increase, for the non-elastic impacts will now take place sufficiently far from the screen, and so on.

The whole process is represented by the diagram shown in Fig. 4, where the absissæ and ordinates represent screen-potential and plate-current respectively. The phenomena described above may be utilized for reception in the manner shown in Fig. 3. It will be easily seen that if the valve is adjusted (by means of batteries 7, 9) to point 15 (see Fig. 4), an oscillating voltage applied between filament and screen will lead to a decrease in the mean value of the plate current. (In Fig. 4 a case is shown when the amplitude of the incoming oscillation is roughly represented by one-half of the line 18 – 19. The mean value of the plate current will then be represented approximately by the ordinate of any point on line 30 – 31).

No. **139,518.** By Westinghouse Lamp Company (assigned by H. C. Rentschler).

This is a patent of addition to No. 139,514 and covers a valve in which the effect of non-elastic impact at the critical velocity between electrons and gas particles is enhanced by utilising the secondary emission of electrons from the plate, as in a "dynatron." The claim reads as follows :—

"An electron tube, as claimed in the Patent Application No. 5899/20 (No. 139,514), characterised by such an adjustment of the electrode spacing and the relative potentials there-between, that the maximum variation of plate electrode current due to resonance potential occurs at a screen electrode potential which corresponds with the maximum variation of plate electrode current due to electron reflection or secondary emission, so that extremely sensitive operation is obtained."

No. **140,449.** By Western Electric Co., Ltd. (assigned by E. O. Scriven).

The specification discloses arrangements for securing in the output circuit of a generating valve oscillating currents of constant amplitude and frequency, and also for utilising the valve as a generator of several frequencies which are multiples of the fundamental.

In Fig. 6 valve 4 is a generator, owing to the coupling 5–6 between its plate and grid circuits. The anode battery 10 is connected in series with resistance 13. The value of the latter is made so high that the anode current is substantially constant. Any small fluctuations in the internal resistance of the valve, brought about by the substitution of one valve by another possessing approximately the same dimensions and the same degree of vacuum, will not affect, therefore, the value of the space-current.

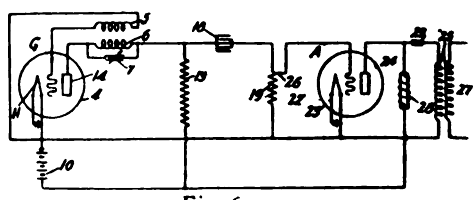


Fig. 6.

For the same reason, small variations of the anode voltage or of the electrical values of other elements of the circuit, due to the conditions of oscillations, will have only a negligible influence on the intensity of the space current. Owing to this, the amplitude and frequency of the generated oscillating current will also be maintained constant.

The H.F. oscillations will flow mainly through the large condenser 18 and small resistance 19. The voltage drop across the latter (which possesses no D.C. component, owing to the insertion of condenser 18), is applied between grid and filament of amplifying valve 24. The high inductance 28 provides a path for the D.C. from battery 10, while condenser 29 prevents the latter from being short-circuited through the primary winding of the transformer 25.

Turning now to Fig. 7, it will be noticed that the path for the H.F. oscillations is formed here by condenser 33 and an inductance 32 (instead of a resistance 19, as in Fig. 6) provided with an iron core. The impedance of this path will therefore depend on the frequency of the oscillations. As the A.C. generated by the valve are not of a pure sinusoidal form, the higher harmonics, notwithstanding their small amplitude as compared with that of the fundamental wave will, nevertheless, produce an appreciable voltage drop across 32, owing to the fact that the impedance of the latter increases with the increase of frequency. After amplification by valve 36 the compound wave is passed on by means of transformer 39 to circuits 42–43, 48–49, etc., tuned to frequencies *f*, 2*f*, 3*f*, etc., *f* being the fundamental frequency generated by valve 4. It is obvious that each of the circuits possess only that frequency to which it is tuned; therefore, currents of frequencies *f*, 2*f*, 3*f*, etc., will be produced in circuits 45, 50, 52, etc., respectively.

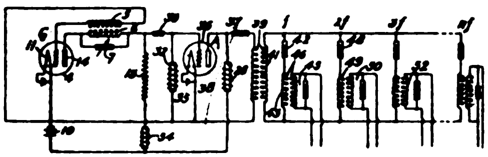


Fig. 7.

No. **141,046.** By WESTERN ELECTRIC CO., LTD. (assigned by R. V. L. Hartley).

Consider the oscillatory circuit 2–3–4 (Fig. 8), in which the condenser 2 is shunted through batteries 9 and 10 by the grid-anode path 8–7 of valve 5. Suppose that at any moment the oscillatory current is flowing in such a direction that terminals 13 and 14 are negative and positive respectively. This will mean that the potential of grid 8 will become more negative, the internal resistance of the valve will become higher, and therefore the voltage drop across 6–7 will also be increased. In other words, the positive potential of the plate will become higher, and, owing to the amplifying properties of the valve, the increment of the plate voltage in the positive sense will be much greater than the increment of the grid potential in the negative sense. Thus the positive charge on coating 14 will be increased, and as it is in phase with the oscillatory current, since we have assumed the latter to flow from 14 to 13, there will result an increase in the energy available in the oscillatory circuit 2–3–4, which will compensate for the losses due to resistance and other causes. On the reversal of the oscillatory current, a reasoning similar to the above, will show that the negative charge on coating 14 will increase, thus leading again to an increase in the oscillating energy, since the current is

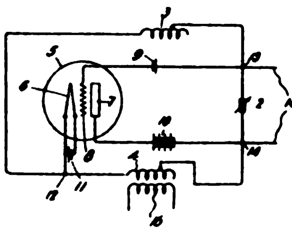


Fig. 8.

now flowing from 13 to 14. It will be seen that the valve, owing to its amplifying properties, supplies energy to the circuit 2–3–4, and if that supply is sufficient to make good the losses, the oscillation once started will maintain itself.

Another way of explaining the generating properties of the arrangement consists in considering the couplings existing between grid and plate circuits. Indeed, on one hand the plate circuit 7–10–14–4–12 is coupled through inductance 4 to oscillatory circuit 2–3–4; on the other hand, the latter is coupled to grid circuit 8–13–3–12 through inductance 3. It follows that the grid and plate circuits, since each of them is coupled to a third circuit (2–3–4), are intercoupled, and therefore the arrangement, as in the well-known case of inductive reaction, should work as a generator.

The special advantage of this method of connection consists in the fact that the capacity between the plate and grid is swamped by the capacity of the parallel condenser 2, with the result that the capacity of the valve cannot " combine with the inductance to form a secondary oscillatory circuit, in which might be set up oscillations having a period different from that of the oscillations it is desired to generate."

No. **141,047.** By WESTERN ELECTRIC CO., LTD. (assigned by E. H. Colpitts).

This relates to a method of modulating by speech the H.F. currents generated by valves. As will be seen from Fig. 9, valve 1 will generate A.C., the frequency of which will depend on the values of the inductances 17 and 14 and the capacity of condenser 18, which elements constitue the grid circuit coupled to the anode circuit through 17 and 4. The high inductance 11 provides a path for the D.C. from battery 10, forming at the same time a very large impedance with respect to the H.F. oscillations. Condenser 8 and 9 cut off the D.C. from coils 3 and 4. For the purpose of modulating the amplitude of the H.F. oscillations in sympathy with the sound vibrations imparted to the diaphragm of microphone 24, the circuit of the latter is coupled by means of a transformer to circuit 19, which, in its turn, is coupled to the grid circuit. It is obvious that the amplitude of the normally generated oscillation (*i.e.*, when the microphone is not actuated) will increase if the potential of the grid is increased, owing to a positive impulse being imparted to it from the microphone circuit and *vice versa*.

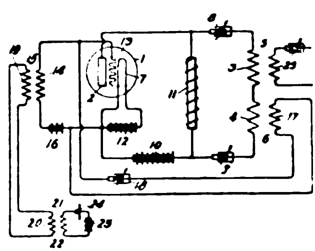


Fig. 9.

No. **141,706.** By SIEMENS-SCHUCKERTWERKE G.m.b.H.

For high-power valves there is, of course, necessary a large emission of electrons from the cathode. The latter has, therefore, to be made in such a way as to possess a large surface, and this involves the necessity of passing through the cathode currents of considerable magnitude. Above a certain limit, however, the sealing into the glass container of the leads, which for large currents have to be of a large diameter, becomes very difficult. In order to overcome this disadvantage, it is proposed to use a cathode of a large surface, which is heated by the bombardment of electrons emitted from an auxiliary cathode brought to incandescence by passing through it a current. The construction of such a valve is illustrated on Fig. 10, where 6 is a filament, heated by a current supplied from battery 7 through resistance 8, 3 is the main cathode heated to a high temperature by the impact of the electrons emitted from 6, and 2 is the anode. In order to impart to the electrons a high velocity, which is necessary if their impact with 3 should result in the liberation of considerable energy sufficient for heating the comparatively

large surface of the latter, a battery 9 is employed for impressing a P.D. between 6 and 3. The advantages of the invention is illustrated in the specification by the following numerical example :—

" Let the auxiliary cathode 6 consist of a wolfram wire of 0·15 mm diameter, it then requires a heating current of about 4 amps. There is no difficulty in leading-in this current. Let the glowing cathode 3 consist of a wolfram cylinder of 0·15 mm thickness and 10 mm diameter. The current required for the direct heating of this glowing cathode would be 250 times as great as the current for the auxiliary cathode 6, and therefore would be about 1,000 amps. It would be quite impossible to lead-in such a current into glass vessels, and only with the greatest difficulty into metal vessels. When making use of the invention, the conditions are quite different. If the glowing cathode 3 is to be heated up to 2,000° C., it will radiate for every 1 cm of the dimensions given 314 watts. These are produced when the glowing cathode is irradiated by electrons, according to the invention, by the use of a voltage of about 630 volts in the auxiliary circuit 9, 10. This corresponds to a current of $\frac{314}{630}$ = approx. : 0·5 amp. for 1 cm length of cylinder of the cathode. For a length of 10 cm the current amounts to 5·0 amps., as compared with 1,000 amps with the direct heating of the cathode. It is thus brought about by the invention that even for a long glowing cathode the current in the auxiliary circuit is reduced to about the amount which corresponds to the heating current of the small auxiliary electrode 6."

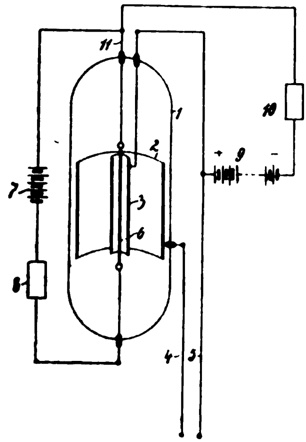


Fig. 10.

No. **141,782.** By WESTERN ELECTRIC Co., LTD. (assigned by H. J. van der Bijl).

Let us assume that between the grid and filament of an amplifying valve are applied simultaneously two alternating potentials of a high and low frequency respectively. In the plate circuit there will be obtained a current of the shape shown in Fig. 12. If this plate current is transmitted to a circuit tuned to the H.F., the current obtained in the latter will be represented by the graph shown on Fig. 13. We say that the H.F. current is modulated by the L.F. There are two conditions which must be satisfied if the modulation is to be of practical use. First of all, it must be perfect, and secondly, complete.

Perfect modulation implies that the variation of the amplitude of the H.F. current should be such that the line joining the points corresponding to the maximum values (or the envelope) reproduces exactly the shape of the L.F. potential impressed on the grid. As the H.F. oscillations shown in Figs. 12 and 13 are due to the amplification of the H.F. oscillations of constant amplitude applied to the grid, it follows that the degree of amplification must be variable. Moreover, the law of variation must be expressible by a linear function of the L.F. potential for otherwise the envelope cannot reproduce exactly the shape of the latter. Let us now consider the grid-voltage anode-current characteristic of the valve shown in Fig. 11. It is

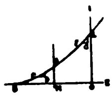


Fig. 11.



Fig. 12.

obvious that an increment in the grid voltage at a point C leads to a smaller increment in the anode current than an equal increment F G at point F, owing to the curvilinear form of the characteristic. The degree of amplification is proportional to $\frac{di}{dv}$ or to the slope of the characteristic at the considered point. According to the explanations given above, we must have for perfect modulation $\frac{di}{dv} = av$, where a is a factor of proportionality. On integration, we obtain:

$$i = av^2 + c,$$

i.e., the curve should be a parabola.

Further, in order that the degree of amplification should depend on the value of the L.F. potential at the considered moment, it is obviously necessary, since the potential of the grid is determined by the algebraic sum of the L.F. momentary values of the low and high frequency potentials, that the amplitude of the latter should be small in comparison with the former. Theoretically, the ratio ought to be infinity, but in practice a value from 3 to 10 gives fairly good results. Thus, for "perfect" grid modulation it is necessary that:

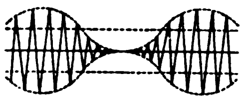


Fig. 13.

(i) The amplitude of the modulating oscillations should be considerably larger than that of the carrier H.F. oscillations, and

(ii) the shape of the valve characteristic should be parabolic.

The condition of "complete" modulation can be expressed by reference to Fig. 11, in the following manner. If M is the point about which the H.F. potential oscillates in the absence of the modulating L.F. potential, the amplitude of the latter should just be M B—that is to say, the plate current should be zero just for the moment when the grid reaches its maximum negative value. This is clearly necessary, for if the amplitude is larger than B M, a portion of the L.F. signal will be cut off; on the other hand, if the amplitude is smaller than B M, there will be an idle current.

The conditions deduced above from general considerations can be satisfied by the arrangement of circuits shown on Fig. 14; 15–16–17 is the microphone circuit, and 14 is the H.F. source. It will be seen that the potentiometer 10 allows of adjusting the ratio of L.F. and H.F. potentials applied between grid 5 and filament 3 of the amplifying valve 3.*

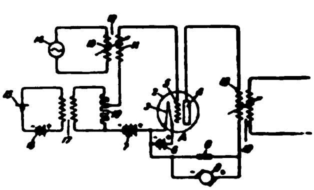


Fig. 14.

With regard to practical applications, the inventor says: "Since for complete and effective modulation it is desirable that the power value of the impressed telephonic wave shall be greater than that of the generated high-frequency oscillations, it will appear that the power value of the modulated high-frequency waves produced in the transformer 19 may well be insufficient for effective radiation from an antennæ. In such case the power may be amplified to the degree required for radiation in any well-known manner. On the other hand, it may well be that the high-frequency oscillations have a fairly large power to start with, and in this case it may be necessary to amplify the telephonic power before impressing the two upon a common amplifier."

* The parabolic shape of the characteristic is assumed by the inventor. See his article in the *Physical Review*. Page 171. September, 1918.

No. 142,474. By WESTERN ELECTRIC CO., LTD. (assigned by H. J. Vennes).

The specification covers a method of producing harmonics by means of an overloaded valve. The principle is illustrated in Fig. 15, where 3 is the well-known grid-voltage anode-current characteristic of a valve, 4 a sinusoidal voltage applied between filament and grid, and 5 the curve of the anode current. It is obvious that owing to the bend A, the upper half of the curve 5 (provided the amplitude of the applied E.M.F. is large enough) will differ considerably from the sine form. On analysing such a curve it will be found that both even and odd harmonics are present.

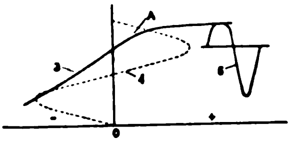


Fig. 15.

In order to make the method applicable to cases where the amplitude of the sinusoidal voltage impressed on the grid is rather small, it is suggested to employ a high resistance in the plate circuit. With the increase of this resistance, the ordinate corresponding to point A, at which the curve bends, will decrease. This is obviously true, because the potential drop across plate-filament of the valve decreases with the increase of the external resistance in the plate circuit, and it is well known that the bend in the characteristic occurs at lower and lower values of the anode voltage as the plate voltage is diminished.

No. 143,262. By WESTERN ELECTRIC CO., LTD. (assigned by P. Schwerin).

In valve generators the heating of the anode, due to the bombardment by the electrons emitted from the filament, may become so high with the increase of the power output that sometimes the plate is melted. In order to overcome this difficulty it is proposed to form the anode of a tube projecting into the bulb and communicating with the atmosphere. The excessive heat can then be dissipated by means of a cooling fluid circulating through the tube.

One construction of a valve, according to the invention, is shown in Fig. 16, where 5–6 is the anode, 3 the grid and 2 the filament.

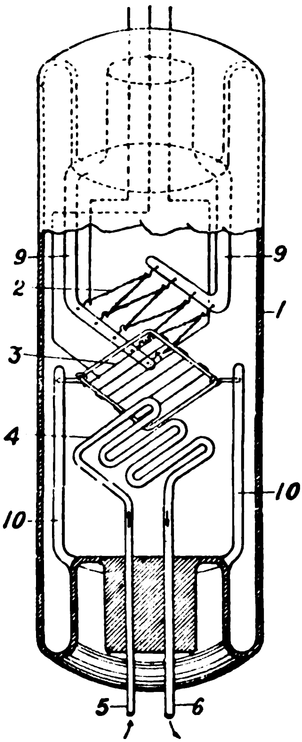


Fig. 16.

No. 144,690. By W. C. HERAEUS G.m.b.H.

This is a patent of addition to No. 138,648, in which "there is described and claimed a process for the manufacture of metal and metal alloys, which process consists in melting the metal or alloy in a gas-tight electric furnace below atmospheric pressure, exhausting the furnace to produce a high vacuum therein, continuously applying heat to the furnace and exhausting the gases therefrom until, with the furnace hermetically closed, no increase of pressure therein is observed."

"According to the present invention this process is applied to the production of metal and metal alloys for the manufacture of parts of vacuum tubes."

"In carrying out the process it has been found that such metals or the like, when rolled into sheets or drawn into wire, or when rendered incandescent in the presence

of any gases, such as hydrogen, will no more absorb noxious quantities of gases and will therefore give no cause for trouble in making the hereinbefore-mentioned tubes."

No. **145,630.** By GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE, M.B.H.

The invention relates to a method of suppressing the tendency to oscillate of an amplifying system consisting of several valves connected in cascade. The claim reads as follows :—

"A thermionic tube amplifier comprising a plurality of thermionic tubes, arranged in cascade, characterised by the feature that the intertube transformers are metal sheathed substantially as and for the purpose set forth."

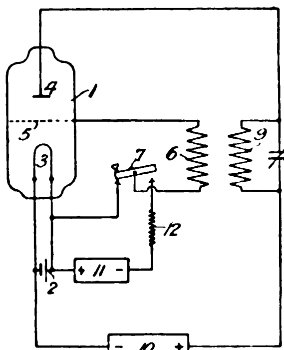


Fig. 17.

No. **147,429.** By GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE, M.B.H.

In order to avoid excessive heating of the anode in valve transmitters, it is desirable that the load should be switched off during the intervals between successive signals. The obvious solution of placing the key in the H.T. supply is inadmissible, owing to the sparking which would result from such an arrangement. It is proposed therefore, to place the key in the grid circuit in the manner shown in Fig. 17. It will be seen that when the key is depressed a negative potential is impressed on grid 5 by battery 11. The value of this potential is chosen sufficiently high to prevent the valve from oscillating. On the other hand, when the key is in signalling position, the battery 11 is disconnected and the valve may oscillate.

No. **147,850.** By GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE, M.B.H.

It is well known that the H.F. oscillations produced by a valve are not pure ; that is to say, besides the fundamental there are also present harmonics. It is important that the latter should be prevented from reaching the antenna and thus being radiated. It is proposed to use for this purpose

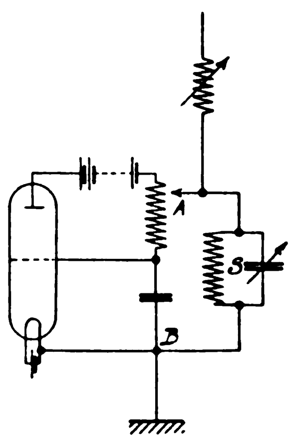


Fig. 18.

rejector-circuits in the manner shown in Fig. 18. (The valve generates in virtue of the capacity-coupling between the grid and plate circuits. The plate circuit is formed by the antenna-earth system.) The circuit S is tuned to the fundamental frequency, and will therefore present an almost infinite impedance against currents of such frequency. On the other hand, currents of different frequencies, such as those due to the harmonics, will be short-circuited by S. It follows that, while the fundamental wave reaches the antenna without loss, the harmonics get absorbed and are not radiated Instead of connecting the rejector circuit in parallel to the circuit formed by the antenna and the earth, one or more circuits, tuned to the frequencies of the main harmonics could be inserted in series with the antenna.

No. **152,865.** By British Thomson-Houston Co., Ltd. (a communication from G.E.C. of America).

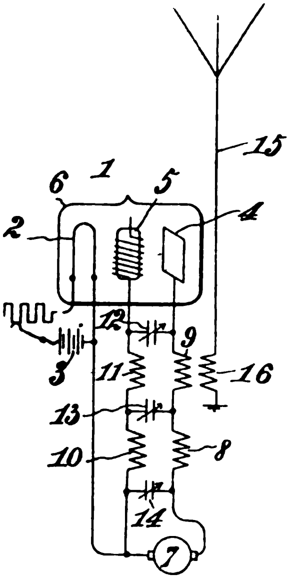


Fig. 19.

The object of the invention is to provide a valve transmitter which would send out either tonic trains of oscillations or two waves differing only slightly one from the other. In either case the necessity of a local source of oscillations at the receiving end for the purpose of heterodyning is obviated. The method of connection is illustrated in Fig. 19. The oscillations (due to the capacity inserted between grid and plate) are produced in circuit 11–12–9–13, on one hand, and in circuit 10–13–8–14, on the other. The latter circuit may be tuned either to an audible frequency or to a high frequency only slightly differing from that of circuit 11–12–9–13. In the first case, the low frequency serves to modulate the H.F. oscillations radiated from the antenna 15. In the second case, both frequencies combine to give beats, which can be detected as an audible note at the receiving station. As to the *modus operandi*, the following statement is made in the specification : —

" Because of the complexity of the current and voltage conditions in the circuits which are arranged in this way, it is difficult to state precisely the manner in which it operates."

No. **152,693.** By J. Scott-Taggart.

The invention relates to a method for producing negative resistance by means of a combination of two valves suitably interconnected.

In Fig. 20 is illustrated an arrangement which exhibits the fundamental idea. Let us assume that, owing to a P.D. applied at D, the potentials of plate 3 in valve A and of grid 5 in valve B become both higher. It follows that the plate-currents of both valves become larger. Owing to the increase of current in the plate circuit of valve B, the potential drop across resistance F will also increase. As resistance F is connected between filament 1 and grid 2, the P.D. between these electrodes will also increase. Taking into account the direction of the anode current of

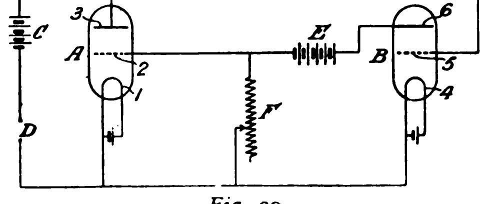


Fig. 20.

valve, it will be easily seen that grid 2 becomes more negative relatively to filament 1, and that, in view of this, the current in the plate circuit of valve A decreases. Thus the application of a P.D. at D results in an increase of current on the one hand, and a decrease on the other. If the latter factor is made to predominate the former—which can easily be done—an increase of P.D. between the filament and plate of valve A leads to a decrease of current flowing between these electrodes, or, in other words, the arrangement acts as a negative resistance.

No. **153,681.** By J. Scott-Taggart.

The invention relates to a method of utilising a valve with two grids for reception. In the Fig. 21 circuit 2–3, tuned to the frequency of the oscillations received by aerial 1, is connected across filament 5 and grid 6. Amplified oscillations will therefore arise in anode circuit 11, which is coupled to circuit 15–14, connected between grid 18 and filament 5. Owing to the presence of the condenser 16, shunted by high resistance 17, the oscillations are rectified and then magnified in plate circuit 11, where they will be heard in telephone 13. If the oscillations to be received are continuous, the circuit 15–14 may be tuned to a frequency slightly differing from that of the signals. Beats will then be produced, and, after rectification, a musical note will be heard in telephone 13. It is pointed out that the closed circuit 2–3, coupled to the aerial, is tuned to the frequency of the incoming wave, while in most heterodyne arrangements this circuit has to be mistuned, which leads to weaker signals. Another use of the described circuit is suggested by the inventor, as follows :—

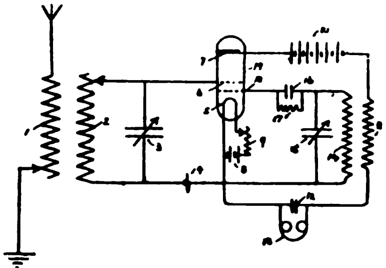


Fig. 21.

"It will be seen that the grid 6 is used for amplifying, while the grid 18 is used in connection with the rectifying process. It may, however, be desirable to eliminate 16, 17 and 13, 12, and use the second grid 18 also in an amplifying manner, the oscillations in 11 being unrectified and capable of being passed on to a detector or further amplifying devices."

"It may be desirable, to get the best results, to couple a portion of either 14 or 11 to either 2 or 1."

No. **153,690.** By J. Robinson, A. K. Macrorie, G. P. Grenfell and H. Morris-Airey.

In Fig. 22, valve 3 is generating oscillations owing to the coupling between the plate and grid circuit. The condenser 6, inserted in the latter, is shunted by the plate-filament path of valve 8. It is well known that if the negative charge accumulating on the grid of a generating valve cannot leak away sufficiently quickly, the oscillations are split up into groups. The frequency of these groups will be determined by the value of the resistance, which is usually connected in shunt to the grid condenser In the present case the value of the shunting resistance will depend on the intensity of the signals supplied from circuit 14–12–13 to the grid circuit of valve 8. It follows that the pitch of the note heard in telephone 15 will vary with the variation of the strength

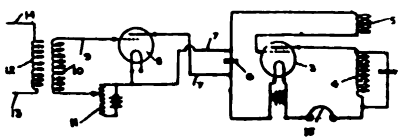


***Fig.* 22.**

of the signals. As to the application and the advantages of the described arrangement, the inventors make the following statement :—

"It will be seen that as the resistance is raised the pitch of the note will diminish, and *vice versa*. Hence, on the reception of signals the usual thing will be for the pitch of the note to be raised."

"It is well known that the ear is more sensitive to differences in pitch than it is to differences of intensity. Hence the advantages to be obtained from a system as above described are numerous."

"One of the outstanding advantages would be in directional reception, in which the pitch of the note in the receiver would depend on the orientation of the direction-finding coils."

"A further advantage presented is, that a system as above described will work satisfactorily for both continuous wave and spark reception, without necessitating any alteration in connections."

No. **154,982.** By H. J. ROUND.

Consider Fig. 23, in which P is the plate and F the filament of a valve For the sake of elucidating the idea we have assumed that the electronic current flowing from the plate to the filament is uniformly distributed over the former. From each of the four sections 1, 2, 3 & 4, into which we have divided the plate, a current $\frac{I}{4}$ is flowing to the filament, I being the total electronic current. If the negative pole of the H.T. battery B is connected to the negative pole of the filament battery b, we shall obviously have the currents $i + \frac{I}{4}$, $i + \frac{I}{2}$, $i + \frac{3I}{4}$ and $i + I$ flowing in the first, second, third and fourth sections of the filament respectively (counting from left to right). Where the electronic current is comparable with the heating filament current, such non-uniform distribution is very inconvenient, as certain sections of the filament are overloaded, while others are not sufficiently utilised.

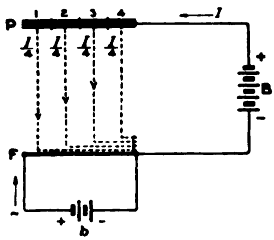


Fig. 23.

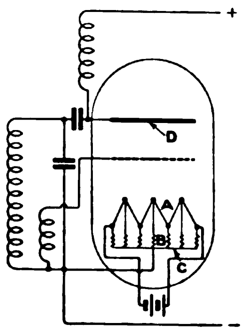


Fig. 24.

In order to overcome this difficulty, it is proposed to sub-divide the filament in the manner shown in Fig. 24. Here the filament A of a valve (shown as connected for generation) is divided into equal portions, each of which is shunted by two resistances of such magnitude that the portion is not short-circuited. The ends of the several resistances remote from the filament are joined together, and the common terminal is connected to the negative pole of the H.T. supply.

It will be seen that, with this arrangement, the electronic current of each portion of the filament is conveyed through the resistances shunting it direct to the terminal of the H.T. supply. The distribution of current along the filament will therefore be more uniform than with the ordinary arrangement, where the electronic current of one portion has to flow through the other adjacent portion.

No. **155,642.** By E. W. B. Gill.

The combination of two valves interconnected, as shown in Fig. 25, has been found by the inventor to give the curve shown in Fig. 26, where the abscissæ and ordinates represent the P.D. between filament F and grid G and the values of current in circuit of anode *a* respectively. It will be noticed that there are two rectifying points, L and M. The arrangement can be used either as a limiting device or for discriminating between different types of signals.

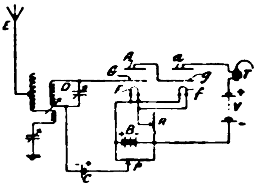


Fig. 25.

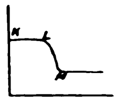


Fig. 26.

With regard to the former application, assume the working point is adjusted to coincide with L. Then, on the arrival of an oscillation, its negative half-cycle will lead to no change in the current passing through telephone T to anode *a*. On the other hand, the positive half-cycle will change the anode current, but this change remains the same for all oscillations with an amplitude exceeding the one determined by the abscissa corresponding to point M.

As to the second application, the inventor says: "Between the two rectifying points L and M signals go to a minimum, and it has been found experimentally that the positions of these minima differ for different types of sending gear. Thus, the minimum for a Telefunken is not the same as for a British Navy spark, and it is possible, if their strengths are about the same, to hear the Telefunken only on one adjustment and the Navy only on a near adjustment. Disturbances due to certain types of "atmospherics" can also be reduced relatively to the signals it is required to receive."

No. **155,854.** By W. H. Eccles and F. W. Jordan.

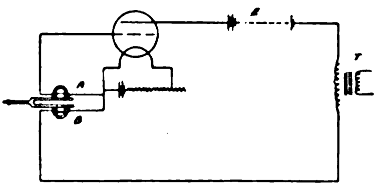


Fig. 27.

With the usual circuits employed in connection with geneating valves, the use of large capacities and inductances is unavoidable if the frequency of the oscillations to be produced is rather low. By the method of coupling between the plate and grid circuits, described in the present specification, this difficulty can be overcome. As shown in Fig. 27, "a tuning fork is so arranged that two electro magnets act upon its prongs, one being in the plate circuit and the other in the grid circuit of the triode. The movement of the grid prong induces E.M.F. in the grid coil A, and this controls the plate current, which, in its turn, on traversing the plate magnet B in the correct sense, sustains the motion of the fork."

Several applications of the principle are shown in the specification.

No. **159,955.** By H. L. Crowther and W. Makower.

The subject of the invention is clearly stated in the claim, which reads as follows:—

"In the process of exhausting gas from the electrodes of a thermionic valve or vacuum tube, heating one or more of the electrodes by currents induced directly therein by an inductance through which high-frequency current is passed, substantially as described."

No. **159,984.** By H. J. Round.

The invention relates to valves with several grids. By properly adjusting the potential of the various electrodes, such a valve can be utilised for performing several operations in one tube, as, for instance, magnification and rectification, or multiple magnification and rectification, etc. The main advantage of the device consists in the saving of energy, which is obtained owing to the fact that instead of several, only one filament has to be heated.

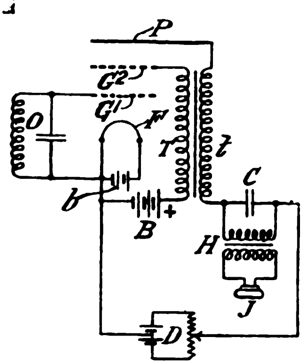


Fig. 28.

Out of the several embodiments of the invention shown in the specification only the following two will be described.

In Fig. 28 is illustrated a method of using a valve with two grids for the purpose of obtaining magnification and rectification. The tuned circuit O represents the source of the H.F. incoming oscillations. The positive pole of the H.T. battery B is connected to grid G^2, which serves as anode. It is clear, therefore, that the system F G^1 G^2 will work as an amplifier for the H.F. currents. By means of transformer T t an alternating potential will be induced between P and F. Current will therefore flow in circuit P t D F only at the moments when the potential of P is positive with respect to F. In other words, the system consisting of the filament F and plate P will behave as a Fleming valve and rectify the magnified oscillations. The potentiometer serves for adjustment to the rectifying point. The rectified signals will be heard in the telephone J, which could, however, be placed in circuit G^2 T B instead of being in circuit D t F.

In Fig. 29 a three-grid valve is shown. The incoming H.F. oscillations in circuit O are impressed by means of transformer Q between G^1 and F. Magnified current will flow in circuit G^2 B F grid G^2 serving as anode. By means of transformer Q^1, a magnified P.D. is impressed between G^3 and F, and second magnification takes place in circuit PBF.

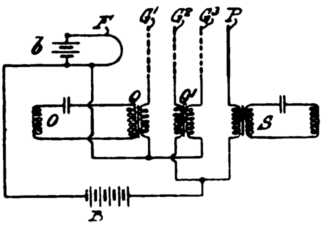


Fig. 29.

Another method of using the same tube is shown in Fig. 30. Here the incoming oscillations from circuit O are impressed between G^3 and F. They are magnified in PBF and then impressed through a transformer between G^1 and F. The second magnification will take place in G^2 B F.

If four grids and plate are taken, double magnification and rectification

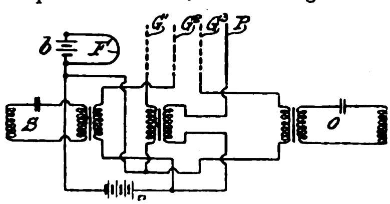


Fig. 30.

could be performed in the same tube. We could further arrange to utilise the tube for a double magnification of the L.F. oscillations.

No. **161,115.** By H. L. Crowther and W. Makower.

For high-power valves, the electron emitting electrode has to be made large and the sealing of the leading-in wires into the container becomes, from the manufacturing point of view, very troublesome.

According to the present invention, it is suggested to heat the cathode in the manner shown in Fig. 31. Here the filament *a* is connected to a low-resistance coil *b*, wholly placed inside the container *c* and forming the secondary of a transformer, the primary *d* of which is placed outside the bulb. The winding *d* is fed from a high-frequency source. The currents

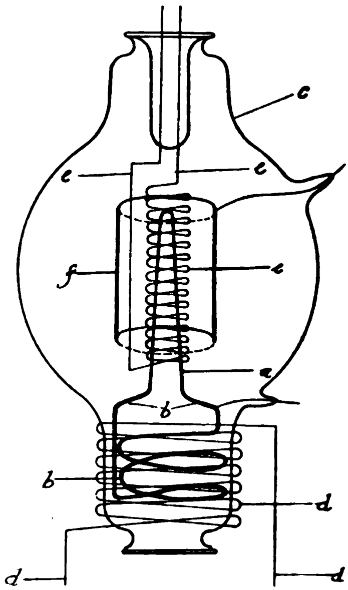


Fig. 31.

induced in the secondary are employed for heating the cathode. It will be seen that with this arrangement the necessity of having seals for the leading-in wires is wholly obviated.

No. **162,067.** By W. H. Eccles and J. H. Vincent.

In valve generators the length of the wave produced depends, *inter alia*, on the strength of the filamant current. All other conditions being constant, the wavelength (λ) will change with the variation of the filament current (i) according to the graph shown in Fig. 32. It will be noticed that the branch CD of the curve is rather flat, *i.e.*, comparatively large variations of i are accompanied only by small changes in λ. It is obvious, therefore, that where constant wavelength and amplitude (for it has been found that the amplitude grows with the wavelength) are of importance, the valve should be adjusted to work in the vicinity of point C. Now, the position of this

point with regard to *i* will depend on the degree of coupling between the plate and grid circuits. As the coupling is increased, point C is shifted to the right. Beyond a certain value of the coupling, therefore, the filament current corresponding to C becomes so large that the filament will burn out. It follows that in order to obtain the branch CD, it is necessary to choose a proper value of the coupling, and the inventors suggest the following procedure.

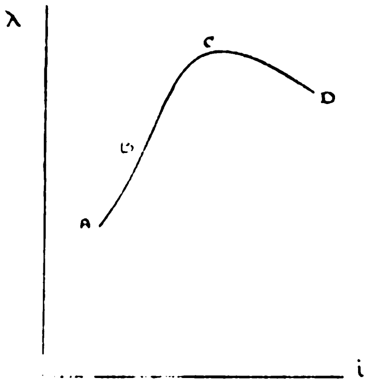


Fig. 32.

"We fix the retroaction or back coupling at an arbitrary value, vary the filament current, observe the wavelength and draw a curve connecting filamant current and wavelength. If at the highest permissible temperature of the filament the curve does not become flat, we reduce the back coupling and repeat the observations as may be necessary. If, on the other hand, the flat part is reached at a low filament temperature, we may increase the coupling if we desire to obtain a larger amplitude than that now obtained. Having completed the independent manipulation of the back coupling and the filamant current, we now link together permanently by aid of any suitable mechanism the adjusting device that varies the filament current, and the adjusting device that varies the retroactive coupling, so that if slight movements are afterwards made at will in either adjustment the other moves appropriately so as to keep the wavelength constant or nearly constant."

It is obvious that the filamant current should be adjusted to the right or left of C, according as to whether a decrease or an increase of its value is expected.

No. **162,338.** By H. St. J. de Aula Donisthorpe.

The invention relates to a special construction of the electrodes of a valve, and is illustrated in Fig. 33. Claims 1 and 2 read as follows:—

(1) "A thermionic valve of the three-electrode type, for use in wireless telegraphy, comprising a hollow hemispherical electrode, a hollow hemispherical grid within said electrode and a filament adjacent to or within the space enclosed by said grid."

(2) "A thermionic valve of the three-electrode type, for use in wireless telegraphy, comprising a hollow hemispherical electrode, a hollow hemispherical grid within said electrode and a loop filament adjacent to or within the space enclosed by said grid."

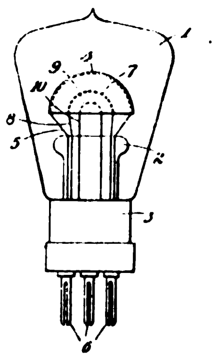


Fig. 33.

No. **163,487.** By The British Thomson-Houston Co., Ltd. (a communication from G.E.C. of America).

Consider the arrangement shown in Fig. 34. Since both the electrodes in the highly evacuated tube 1 are in the form of filaments 2 and 3, heated by batteries 4 and 5, the high frequency E.M.F., due to the signals received on aerial 8 and impressed between them through the resonant circuit 9–10

will result in the H.F. currents being substantially of the same shape as the signals. There will be no rectification, as the characteristic of the tube 1 is a straight line. Indeed, if K (see Fig. 35) represents the functional dependence of the current flowing from 2 to 3 on the P.D. between the latter, L will be the corresponding characteristic when the current from 3 to 2 is considered.

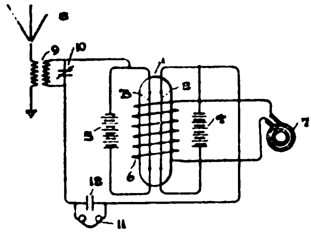


Fig. 34.

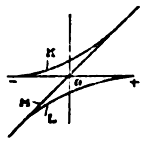


Fig. 35.

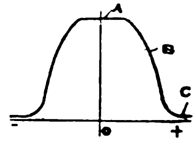


Fig. 36.

The resulting characteristic will, therefore, be represented by the straight line M. Let us now assume that a source 7 of A.C. is connected to the terminals of coil 6 wound round tube 1 in such a way that the axis of the alternating magnetic field is parallel to 2 and 3. It will then be found that the conductivity of the tube will depend on the momentary values of the A.C. flowing through 6 in the manner shown by the graph ABC (see Fig. 36). At the moment when the current in 6 is at its maximum value, say, in the positive direction, the conductivity reaches a minimum. As the current and the strength of the magnetic field decrease, the conductivity increases, until it reaches a maximum value shortly before the current passes through zero. It then remains at this value for some time while the current is growing in the negative direction. From a certain value of the current the conductivity begins to decrease until it becomes again minimum, either shortly before or at the moment when the current is maximum in the negative direction. The variation in the resistance of the valve is due to the fact that the magnetic field affects the path of the electrons. The latter move, usually, in straight lines. When a magnetic field is applied, the motion takes place along spirals and as the strength of the field is increased more and more of the electrons emitted by one electrode are prevented from reaching the other. At a certain value of the magnetic field practically no electrons can pass between the electrodes.

Suppose now, we make the frequency of source 7 equal to one-half of the signal frequency. Let curve i (Fig. 37) represent the current from

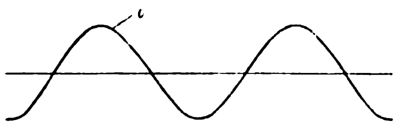


Fig. 37.

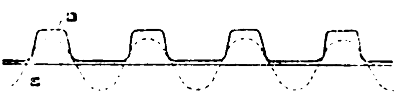


Fig. 38.



Fig. 39.

source 7 and curve E (*see* Fig. 38) the signalling potential impressed between 2 and 3. Curve D will then represent the variation in the conductivity of the tube. The resulting current through the latter will be given by graph F (Fig. 39). It will be seen that almost ideal rectification is obtained. After smoothing out, the rectified current can be used for actuating a recording device, but it cannot obviously be employed in connection with a telephone for the purpose of obtaining an audible note. Another drawback of the method just described consists in the necessity of keeping the frequency of the local source strictly equal to one-half of that of the signal. This condition is very hard to satisfy in practice. It is still harder to maintain the phase relation between the local and incoming currents. In view of this, it is proposed to adjust the frequency of the local source to a value slightly different from half of the signal frequency. In this case an audible note will be obtained of a frequency equal to

$$\pm 2\left(\frac{N - N_1}{2}\right)$$

where N and N_1 are the frequencies of the signal and local source respectively. The manner in which this is obtained is clearly seen from Fig. 40, where the

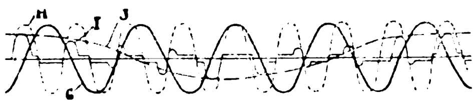


Fig. 40.

curves G, H, I, J represent respectively the locally produced current, the signalling potential, the current through the tube and the smoothed-out current flowing through the telephone.

A special advantage of the described detector consists in the rectilinear form of its characteristic (*see* line M on Fig. 35). It is well known that in the case of ordinary valve characteristics the current is proportional, not to the E.M.F., but to some power, higher than unity, of the latter. Roughly :

$$i = ke^2.$$

It follows that if an atmospheric is twice as strong as the signal, the output current, due to the atmospheric, will be four times as strong as that due to the signal. With the present arrangement, the ratio of currents will be only 2 : 1. It follows that the strength of atmospherics will be comparatively reduced.

No. **165,824.** By H. J. Round.

The invention relates to the construction of high-power transmitting valves, and is illustrated in Fig. 41, described by the inventor as follows :—

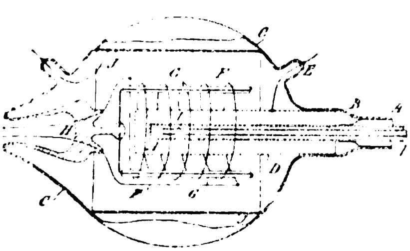


Fig. 41.

" A is a hollow metal tube, closed at its inner end and sealed at B into the glass of the bulb C and acting as the anode. It is surrounded by a grid D, the lead from which passes out through the glass at E. F is a filament, which is arranged preferably as a coil around the grid, and is maintained in position by supports G, the leads from it being sealed through the glass at H. I is a tube which is arranged along the axis of the anode A and through which cooling fluid may be introduced. J is a cage, or sheath,

of metal surrounding the filament for the purpose of preventing the emission from reaching the glass. In some cases this sheath may be provided with a negative charge of electricity."

No. **166,260.** By J. Scott-Taggart.

The invention relates to an electron discharge device, specially designed for the purpose of obtaining a negative resistance effect. The device and the circuits are illustrated in Fig. 42. A and B are two anodes, arranged on opposite sides of the filament F. G is the grid. The batteries C and D are connected with their positive poles to the anodes A and B respectively. The battery E is connected between A and G in such a manner that G is negative with respect to F. (If E were absent, the P.D. between F and G would be determined by the voltage of battery C.) It is obvious that the number of electrons reaching A and B together (apart from the small number of electrons absorbed by G) will be substantially equal to the total emission from the filament.

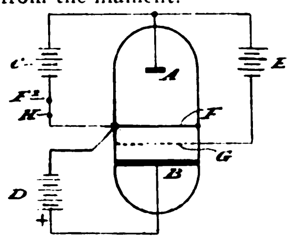


Fig. 42.

As to the distribution between A and B, the determining factor will be the potential of the grid. If G, for instance, is highly negative, no electrons at all will reach B, and the whole emission from the filament will be diverted towards A. With the increase of the grid potential, a portion of the electrons will be attracted by B, thereby causing a reduction in the A anode current.

Assume, now, that an E.M.F. is applied between points F¹ and H, for instance, in such a manner that the P.D. between A and F is increased. This would lead to an increase of the A current. However, as the P.D. between F and G is increased at the same time, a portion of the electrons is diverted from A to B. The current is therefore decreased. If the decrease is made to predominate (and this can obviously be obtained) the final result will be a decrease in the current of A following upon an increase of the E.M.F. and *vice versa*. In other words, the device behaves as a negative resistance and can be employed as such for various purposes, as for instance, amplification, generation of oscillations, etc.

The inventor refers throughout the specification to the device as "the Negatron."

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1921

Specification No.	Date of Application.	No. of Application.	Name of Inventor.	Subject.
9,285/1914	14/4/14	9,285/14	O. Scheller and C. Lorenz, A-G.	Tuning antennae to plurality of waves
5,342/1915	9/4/14	5,342/15	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Reception of C.W.
7,358/1915	30/5/14	7,358/15	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Reception of C.W.
122,640	20/1/19	1,392/19	F. Lowenstein	Quench spark gaps
125,945	20/4/18	8,215/19	H. Pilon	Rectifiers
130,595	1/8/18	18,435/19	W. Dubilier & Dubilier Condenser Co., Ltd.	Condensers
132,799	5/6/18	22,791/19	C. Lorenz, A.G.	Arc-generators
133,306	1/10/18	23,906/19	L. Levy	Method of Elimination of interference
134,830	4/11/18	26,488/19	E. F. W. Alexandeson ..	H.F. alternators
135,504	7/9/15	28,844/19	E. C. Hanson	Method of eliminating interference
137,073	27/11/16	32,411/19	F. A. Kolster	Aerials
137,271	30/12/18	17,208/19	E. H. Armstrong ..	Short wave receivers
137,856	15/3/15	1,386/20	R. Bosch, A-G.	Condensers
138,318	30/1/19	32,415/19	F. A. Kolster	Aerials
138,366	18/11/13	2,902/20	R. G. Goldschmidt ..	Excitation of oscillating circuits
138,610	31/1/19	3,000/20	L. N. Brillouin	Wired wireless
139,494	4/2/18	5,715/20	M. I. Pupin	Cascade arrangement of valves for amplification
139,496	4/2/18	5,728/20	M. I. Pupin	Piezo-electric receiver
139,514	27/2/19	5,899/20	Westinghouse Lamp Co., and H. C. Rentschler	Electron tube apparatus
139,518	27/2/19	5,978/20	Westinghouse Lamp Co. and H. C. Rentschler	Electron tube apparatus
140,045	7/3/19	18,437/19	W. Dubilier & Dubilier Condenser Co., Ltd.	Condensers
140,046	7/3/19	18,438/19	W. Dubilier & Dubilier Condenser Co., Ltd.	Condensers
140,449	4/6/17	8,081/20	Western Electric Co., Ltd., and E. O. Scriven	Production of electric oscillations by vacuum tubes
140,773	22/3/20	8,450/20	O. Billieux	H.F. Alternator
141,038	28/3/19	8,657/20	Western Elec. Co., Ltd., and H. de F. Arnold	Amplifying system with valves
141,040	5/1/16	9,099/20	Western Elec. Co., Ltd., and H. de F. Arnold	Method of eliminating disturbances
141,046	1/6/15	9,222/20	Western Elec. Co., Ltd., and R. V. L. Hartley	Valve generators
141,047	18/5/14	9,223/20	Western Elec. Co., Ltd., and E. H. Colpitts	Modulation with valves
141,344	1/4/20	9,496/20	De Forest Radio Telephone and Telegraph Co., and R. F. Gowen	Self-supporting inductance coils
141,690	11/4/19	9,486/20	W. Dubilier & Dubilier Condenser Co., Ltd.	Condensers
141,706	27/1/17	10,188/20	Siemens-Schuckertwerke, G.m.b.H.	Cathodes for valves heated by electronic-bombardment
141,738	21/8/15	10,549/20	Western Elec. Co., Ltd., and H. J. Van der Bijl	Modulation with valves; wired wireless
141,745	16/4/20	10,644/20	E. F. W. Alexanderson, B.T.H. Co., Ltd.	H.F. Alternator
142,074	18/4/19	29,935/19	E. F. W. Alexanderson..	Directional receiving system
142,115	15/7/15	11,066/20	Western Elec. Co., Ltd., and G. A. Campbell	Electric wave filters
142,474	28/4/19	11,638/20	Western Elec. Co., Ltd., and H. J. Vennes	Production of harmonics by valves
143,268	14/5/20	13,352/20	Western Elec. Co., Ltd., and P. Schwerin	Thermionic valve; cooling device for anode
143,519	1/11/16	13,538/20	Western Elec. Co., Ltd., and H. W. Weinhart	Means for cooling electrodes of valves

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1921 (*continued*).

Specification No.	Date of Application.	No. of Application.	Name of Inventor.	Subject.
143,929	9/4/19	14,672/20	H. Pilon	Rectifiers
144,295	4/6/18	15,010/20	Siemens-Schuckertwerke, G.m.b.H.	Means for cooling electrodes of valves
144,690	18/4/18	15,645/20	W. C. Heraeus, G.m.b.H.	Treatment of metal used in manufacturing electrodes of vacuum tubes
144,698	22/6/14	15,727/20	Western Elec. Co., Ltd., and Bell Telephone Manufacturing Co.	Telephones
145,039	14/6/19	16,094/20	Marconi's W.T. Co., Ltd., and C. L. Farrand	Valves with electrodes outside the evacuated vessel
145,040	14/6/19	16,095/20	Marconi's W.T. Co., Ltd., and C. L. Farrand	Valves with 5 electrodes for generation
145,049	4/11/16	16,183/20	E. Bellini	Radiogoniometers
145,476	16/6/17	16,704/20	L. de Forest	Subterranean signalling systems
145,630	16/11/15	17,858/20	Gesellschaft fur Drahtlose Telegraphie, m.b.H.	Intervalve transformers
145,777	25/10/16	18,153/20	Siemens & Halske, A.G...	Cascade arrangement of valves for amplification
146,204	3/11/16	17,413/20	Société Française Radio-Electrique	Aerial system
146,519	2/10/16	18,643/20	Western Elec. Co., Ltd., and R. A. Heising	Source of supply of grid potential
146,528	6/1/16	18,652/20	Radio Corporation of America and R. A. Weagant	Aerial system
146,925	8/7/19	6,773/20	L. Segal	Condensers
146,988	3/3/16	18,910/20	Western Elec. Co., Ltd., and R. A. Heising	Modulation with valves
147,429	7/7/20	19,332/20	Ges. für Drahtlose Telegraphie, m.b.H.	Thermionic valve transmitter
147,432	7/7/20	19,335/20	Ges. fur Drahtlose Telegraphie, m.b.H.	Recorders
147,437	7/7/20	19,340/20	Ges. für Drahtlose Telegraphie, m.b.H.	Condensers
147,438	7/7/20	19,341/20	Ges. fur Drahtlose Telegraphie, m.b.H.	Controlling speed of electric motor
147,440	7/7/20	19,343/20	Ges. fur Drahtlose Telegraphie, m.b.H.	Locating underground or hidden electric conductors
147,442	7/7/20	19,345/20	Ges. für Drahtlose Telegraphie, m.b.H.	Directive W.T. with several separated antennae
147,444	7/7/20	19,347/20	Ges. für Drahtlose Telegraphie, m.b.H.	Frequency multipliers.
147,447	7/7/20	19,350/20	Ges. fur Drahtlose Telegraphie, m.b.H.	Wired wireless
147,698	7/7/20	19,686/20	Ges. für Drahtlose Telegraphie, m.b.H.	Selective transmitter for W.T.
147,754	8/7/20	19,757/20	Ges. für Drahtlose Telegraphie, m.b.H.	H. F. current transformers
147,801	9/7/20	19,844/20	Société Française Radio Electrique	Frequency changes
147,817	9/7/20	19,862/20	J. H. Clough and B.T.H. Co., Ltd.	Enclosed electric arc device
147,850	9/7/20	19,902/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Method of eliminating harmonics from valve-generators.
149,349	5/8/19	21,914/20	Metropolitan-Vickers Elec. Co., Ltd., and Q. A. Brackett	Valves with two filaments and two plates
150,701	30/8/20	25,046/20	Gesellschaft für Drahtlose Telegraphie, m.b.H.	Method of receiving C.W.
151,848	6/11/19	27,433/19	N. Lea and Radio Communication Co., Ltd.	Wavemeter
151,928	21/9/20	26,901/20	R. V. L. Hartley and Western Elec. Co., Ltd.	Modulators with valves
152,086	3/7/19	16,691/19	J. Erskine-Murray ..	Improvements relating to thermionic valves in cascade
152,190	23/9/19	23,406/19	J. H. Smart and J. Tucker	Application of valve amplifiers to land lines
152,365	13/12/16	17,916/16	B.T.H. Co., Ltd., and G.E.C. of America	Thermionic valve generators
152,386	13/6/19	14,994/19	E. E. Frankis	Method of eliminating interference in receivers.
152,409	11/7/19 2/10/19	17,424/19 24,106/19	B.T.H. Co., Ltd., and G.E.C. of America	Variable condensers.

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1921 (*continued*).

Specification No.	Date of Application.	No. of Application.	Name of Inventor.	Subject.
152,422	14/7/19	17,583/19	B.T.H. Co. Ltd., and G.E.C. of America	Aerials: means for thawing sleet from them.
152,487	9/9/19	22,151/19	B.T.H. Co., Ltd., and G.E.C. of America	Recorder
152,693	25/7/19 18/9/19	18,492/19 22,960/19	J. Scott-Taggart ..	Production of negative and positive resistance in vacuum tube devices
152,758	18/7/19	17,973/19	J. Erskine-Murray ..	Radio-navigational apparatus
152,811	7/8/19	19,479/19	Western Elec. Co., Ltd...	Modulators with valves
152,915	13/2/20	4,396/20	L. B. Turner	High speed telegraphy: reception of
153,027	24/7/19	30,410/20	W. Dubilier and Dubilier Condenser Co., Ltd.	Condensers
153,319	12/7/20	20,891/20	M. Latour	Vacuum tube relay arrangement
153,331	16/11/16	10,427/16	B.T.H. Co., Ltd., and G.E.C. of America	Enclosed electric arc device
153,532	15/4/15	12,225/20	B.T.H. Co., Ltd., and G.E.C. of America	Thermionic valve with several electrodes
153,672	12/8/19	19,799/19	Western Elec. Co., Ltd...	Multiplex carrier current system
153,681	14/8/19	20,052/19	J. Scott-Taggart.. ..	Thermionic valve with two grids
153,690	18/8/19	20,288/19	A. K. Macrorie, G. P. Grenfell, J. Robinson and H. Morris-Airey	Reception of C.W.
153,858	28/10/19	14,592/20	A. W. Isenthal	Variable condensers
153,932	17/6/19	15,229/19	M. Compare & Comparri Wireless Control Syndicate, Ltd.	Detectors
154,232	22/2/16	2,639/16	B.T.H. Co., Ltd., and G.E.C. of America	Thermionic valve amplifiers
154,247	27/5/19	13,328/19	B.T.H. Co., Ltd., and G.E.C. of America	C.W. transmitters
154,364	8/9/19	22,039/19	J. Scott-Taggart.. ..	Improvements in valves as rectifiers
154,386	19/9/19	23,118/19	F. G. Goldstone and S. Brydon	Variable condensers
154,537	23/11/20	33,063/20	E. C. Hanson	Wireless telephone transmitting system employing waves at audio-frequency
154,637	13/5/19	11,966/19	C. A. Oliver	Handcart for transporting W.T. apparatus in forward battle areas
154,720	5/9/19	21,892/19	P. Trichard	Frequency multipliers
154,872	8/5/20	12,835/20	N.V. Philips' Gloelampenfabrieken	Cathode rectifiers for A.C.
154,982	3/9/19	21,594/19	H. J. Round	Cathodes for valves
155,061	26/9/19	23,752/19	G.E.C. of America and B.T.H. Co., Ltd.	H. F. alternators
155,328	14/8/19	20,029/19	B. S. Gossling and G.E. Co., Ltd.	Cascade arrangement of valves for amplification
155,330	14/8/19	20,043/19	C. S. Franklin	Spaced aerial system
155,409	10/10/19	24,845/19	A. E. J. Vlug	Variable inductance
155,554	9/3/20	7,176/20	J. E. Lilienfeld	Valve in which cathode and anode are in the form of sharp edges or points
155,602	11/9/18	14,778/18	B.T.H. Co., Ltd., and G.E.C. of America	Modulators with valves
155,642	22/9/19	23,313/19	E. W. B. Gill	Valve as current limiting device
155,689	21/10/19	25,820/19	L. Satchwell	Manufacture of grid resistances
155,854	17/4/18	6,515/18	W. H. Eccles and F. W. Jordan	Valve generators
156,330	6/10/19	24,406/19	J. B. Bolitho	Valve amplifiers and relays
156,411	2/1/20	52/20	O. Durdle and G. E. Co., Ltd.	Supports for filament of valves
156,876	6/10/19	24,405/19	J. B. Bolitho	Modulators with valves
157,041	4/3/16	24,546/20	B.T.H. Co., Ltd., and G.E.C. of America	Thermionic tube rectifiers
157,477	14/2/19	3,702/19	E. Berry and Marconi's W.T. Co., Ltd.	Control of flow of electrons in valves
157,607	14/11/19	28,301/19	L. B. Turner and C. T. Hughes	Short wave receivers
158,006	11/4/19	9,316/19	J. Erskine-Murray and J. Robinson	Direction finders
158,011	28/7/19	18,634/19	L. A. McDougald ..	Means for cooling anode of valve
158,200	8/3/18	4,117/18	J. H. Hammond, jr. ..	Secret system for W.T.
158,284	12/4/19	9,364/19	M. Jeance..	Direction-finders

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1921 (*continued*).

Specification No.	Date of Application.	No. of Application.	Name of Inventor.	Subject.
158,291	19/8/19	20,398/19	W. T. Ditcham and H. J. Round	Transmitters
158,353	3/11/19	27,039/19	R. St. George-Moore and G. S. Whitmore	Means for supporting antennae
158,455	5/1/20	347/20	H. P. Rees	Inductances
158,458	19/1/20	1,659/20	B.T.H. Co., Ltd., and G.E.C. of America	Helium-filled electric discharge device
158,707	11/11/19	27,950/19	W. J. Picken and J. G. Robb	Aerial systems.
158,790	14/11/19	28,320/19	S. R. Mullard	Means for renewing filament of valves
158,762	5/12/19	30,488/19	J. Robinson and H. L. Crowther	Means for reducing disturbing effects of loud signals and the like
158,927	24/9/19	23.510/19	C. S. Franklin	Aerial systems
159,008	17/11/19	28,491/19	C. S. Franklin, W. J. Picken and J. G. Robb	Aerial systems
159,322	25/11/19	29,392/19	B.T.H. Co., Ltd., and G.E.C. of America	Cascade arrangement of valves for amplification
159,377	17/12/19	31,673/19	J. Robinson and H. L. Crowther	Receiving system
159,564	22/11/19	29,141/19	H. M. Dowsett	Cathode for valves
159,601	1/12/19	29,912/19	J. Erskine-Murray and J. Robinson	Direction finding
159,603	1/12/19	29,936/19	B.T.H. Co., Ltd., and G.E.C. of America	Reception of C.W.
159,679	16/12/19	31,572/19	R.M. Radio, Ltd., A. Williams, and H. J. A. Donisthorpe	Receiving apparatus
159,683	17/12/19	31,674/19	J. Robinson and H. L. Crowther	Receiving apparatus.
159,694	24/12/19	32,295/19	J. Robinson and H. L. Crowther	Valves as amplifiers
159,920	6/11/19	27,314/19	J. Scott-Taggart.. ..	Means for supporting electrodes in vacuum tubes
159,955	4/12/19	30,355/19	H. L. Crowther and W. Makower	Means for exhausting gases in vacuum-tubes
159,959	5/12/19	30,487/19	J. Robinson and H. L. Crowther	Reception of C.W.
159,984	9/12/19	30,843/19	H. J. Round	Valves with two or more grids
160,027	31/12/19	32,828/19	J. Harrison	Masts
160,196	5/9/19	21,891/19	P. Trichard	Oscillographs
160,250	15/12/19	31,345/19	J. Erskine-Murray, J. Robinson, and H. L. Crowther	Direction finders
160,251	15/12/19	31,346/19	J. Erskine-Murray, J. Robinson, and H. L. Crowther	Direction finders
160,475	19/8/19	20,399/19	H. J. Round	Direction finders
160,502	24/11/19 29/ 5/20	29,296/19 14,683/20	C. K. Chandler	Means for preventing magneto noises from interfering with reception of signals on aircraft
160,846	18/3/19	6,749/19	B.T.H. Co., Ltd., and G.E.C. of America	Directional signalling
160,941	31/12/19	32,830/19	B.T.H. Co., Ltd., and G.E.C. of America	Reception of C.W.
160,975	13/1/20	1,101/20	F. Murphy	Direction finders
160,981	14/1/20	1,249/20	H. St. J. de A. Donisthorpe and R. M. Radio	Portable receiving set
161,115	2/2/20	23,961/20	H. L. Crowther and W. Makower	Cathodes for valves
161,256	2/1/20	151/20	B.T.H. Co., Ltd., and G.E.C. of America	Reception of C.W.
161,266	3/1/20	254/20	B. Binyon and Radio Communication Co., Ltd.	Arc generators
161,448	23/4/20	11,278/20	G. P. Grenfell, J. Erskine-Murray, J. Robinson and H. L. Crowther	Directional transmitters
161,449	23/4/20	11,313/20	J. Robinson and H. L. Crowther	Direction finders
161,619	28/11/19	29,723/19	Western Elec. Co., Ltd.. .	Grids for vacuum tubes
161,652	9/1/20	809/20	W. H. Nottage and T. D. Parkin	Calling device

Wireless Telegraph Patents

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1921 (*continued*).

Specification No.	Date of Application.	No. of Application.	Name of Inventor.	Subject.
161,667	12/1/20	1,007/20	H. R. C. Van de Velde and J. M. Furnival	Direction finding means for aircraft
162,067	21/1/20	1,871/20	W. H. Eccles and J. H. Vincent	Valve transmitters
162,097	28/1/20	2,687/20	E. Hoghton and Portholme Aircraft Co., Ltd.	Reception of C.W.
162,338	23/12/19	32,244/19	H. St. J. de A. Donisthorpe	Thermionic valve with hemispherical electrodes
162,367	23/1/20	2,338/20	A. K. Macronie, C. L. Fortescue, G. B. Bryan and H. Morris-Airey	Thermionic valve in metallic vessels
162,710	3/12/19	30,161/19	J. Scott-Taggart.. ..	Thermionic valve for use as amplifier, relay, detector, etc.
162,761	31/1/20	3,068/20	W. T. Ditcham	Thermionic valve transmitter
162,762	31/1/20	3,069/20	W. T. Ditcham	Thermionic valve transmitter
162,770	2/2/20	3,218/20	A. K. Macrorie and W. A. Appleton	Reception of C.W.
162,771	2/2/20	3,222/20	A. K. Macrorie and S. H. Long	Low frequency amplification in W.T. receivers
162,772	2/2/20	3,223/20	A. K. Macrorie and H. Morris-Airey	Holders for thermionic valves
162,773	2/2/20	3,224/20	A. K. Macrorie and H. Morris-Airey	Valves with two anodes
162,781	3/2/20	3,558/20	A. K. Macrorie and G. A. Irving	Transmitters for wireless telephony
163,070	24/12/19	32,413/19	S. B. Smith and G. M. Wright	Aerial system for direction finding
163,097	9/2/20	3,918/20	R. C. Clinker and B.T.H. Co., Ltd.	Frequency meters
163,117	11/2/20	4,273/20	A. K. Macrorie, H. Morris-Airey and G. Shearing	Reaction principle with valves
163,118	11/2/20	4,274/20	A. K. Macrorie and G. Shearing	Valve transmitters
163,448	14/2/20	4,583/20	H. M. Dowsett	Crystal detectors
163,458	16/2/20	4,739/20	A. K. Macrorie and G. Shearing	Valve transmitters
163,462	17/2/20	4,799/20	W. H. Eccles and J. H. Vincent	Receiving system
163,487	20/2/20	5,172/20	B.T.H. Co., Ltd., and G.E.C. of America	Valves magnetically controlled: detectors
163,725	7/3/17	3,023/17	H. L. E. Skipwith and C. L. Fortescue	Valve transmitters
163,745	12/1/20	974/20	B.T.H. Co., Ltd., and G.E.C. of America	Amplifiers: valve with two electrodes
163,810	26/2/20	5,813/20	E. Hoghton and Portholme Aircraft Co., Ltd.	Cascade arrangement of valves for amplification
163,855	19/3/20	8,177/20	J. Erskine-Murray and J. Robinson	Direction finding systems
164,100	27/2/20	5,987/20	S. Moehl	Masts
164,105	28/2/20	6,079/20	W. T. Ditcham	W. telephone transmitters
164,175	19/3/20	8,249/20	G. E. C., Ltd., B. S. Gossling and A. C. Bartlett	Cathodes for valves
164,242	15/6/20	16,154/20	Western Elec. Co., Ltd...	High frequency carrier current system
164,506	11/3/20	7,376/20	H. J. Round	Aerial system
164,527	16/3/20	7,818/20	A. W. Whistlecroft and H. R. C. Van de Velde	Aerial winch for aircraft stations
164,900	1/4/20	9,133/20	G. A. Mathieu	Valve relays or amplifiers
164,924	22/4/20	11,241/20	Igranic Elec. Co., Ltd., and Cutler-Hammer Manufacturing Co.	Controlling speed of machines by means of valves
164,937	23/4/20	11,312/20	J. Robinson and H. L. Crowther	Direction finding system
165,115	18/8/19	20,252/19	J. Scott-Taggart.. ..	Valves as amplifiers containing two grids
165,157	16/3/20	7,785/20	Western Elec. Co., Ltd...	Support for electrodes in vacuum tubes
165,217	24/3/20	8,683/20	W. A. E. Quilter ..	Grids for valves
165,279	28/4/20	11,748/20	J. Scott-Taggart, F. O. Read and P. W. Engelbach	Support for electrodes in vacuum tubes
165,281	29/4/20	11,895/20	H. W. Sullivan and J. Joseph	Variable condensers

BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1921 *(continued)*.

Specification No.	Date of Application.	No. of Application.	Name of Inventor.	Subject.
165,576	15/4/20	10,552/20	A. R. Taylor	Inductance coils
165,824	5/5/19	11,202/19	H. J. Round	Means for cooling electrodes of valves
165,888	29/1/20	2,808/20	S. Brydon..	Valves for recording purposes
165,889	2/2/20	3,220/20	A. K. Macrorie and G. Shearing	Safety device for valves
165,959	8/4/20	9,897/20	A. McLellan and H. J. Round	Safety device for valves
165,985	22/4/20	11,239/20	Igranic Elec. Co., Ltd., and Cutler-Hammer Manufacturing Co.	Method for converting D.C. into A.C. by means of valves
165,986	22/4/20	11,240/20	Igranic Elec. Co., Ltd., and Cutler-Hammer Manufacturing Co.	Frequency changer
165,994	27/4/20	11,667/20	H. L. Crowther, L. A. McDougald, H. Morris-Airey and G. A. Irving	Transmitters for W. telephony
166,156	30/1/17	1,515/17	N. Oboukhoff	Frequency changers
166,189	12/6/18	9,642/18	J. Scott-Taggart.. ..	Instrument for measurement of capacity of condensers
166,195	26/9/18	15,695/18	J. H. Hammond.. ..	Secret system of wireless telegraphy and telephony.
166,223	20/5/19	12,610/19	J. J. Aurynger	Detectors
166,224	22/5/19	12,939/19	H. Antranikian	H.F. alternator
166,237	28/7/19	18,051/19	J. Scott-Taggart ..	Detectors
166,241	7/8/19	19,498/19	H. J. Round	Valve with low internal resistance
166,259	16/9/19	22,790/19	C. Lorenz, A-G.	H.F. alternator
166,260	17/9/19	22,863/19	J. Scott-Taggart.. ..	"Negatron." Valve with two anodes
166,300	11/2/20	4,275/20	A. K. Macrorie and G. Shearing	Method for eliminating effects of parallel resonance in connection with valve transmitters
166,358	15/4/20 15/7/20	10,551/20 21,354/20	A. R. Taylor	Wireless Telephone transmitters: special anode control
166,365	20/4/20	10,944/20	B.T.H. Co., Ltd., and G.E.C. of America	Thermionic valve
166,578	10/1/19	778/19	H. R. Rivers-Moore ..	Localisation of a submerged cable
166,594	27/9/19	23,801/19	S. Brydon	W. telephone transmitters
166,634	16/3/20	7,851/20	A. K. Macrorie, H. Morris-Airey, G. Shearing and R. L. Randall	C.W. transmitters
166,640	25/3/20	8,833/20	A. K. Macrorie and G. Shearing	Cathodes for valve with uniform current distribution
166,662	14/4/20	10,404/20	Western Elec. Co., Ltd. ..	H.F. carrier current system
166,680	17/4/20	10,760/20	K. E. L. Guinness ..	Method for eliminating magneto noises on aircraft
166,760	11/5/20	13,042/20	B.T.H. Co., Ltd. and G.E.C. of America	Magnetically controlled valves for generation of H.F. currents
166,780	21/5/20	14,043/20	J. Robinson and R. T. Smith	Direction finding system
166,913	3/5/20	94/20	G. A. Mathieu	Intervalve transformers
166,940	17/4/20	10,709/20	W. H. Eccles	Relays
166,958	23/4/20	11,311/20	C. K. Chandler ..	Direction finding apparatus
167,018	12/5/20	13,160/20	G. M. Wright	Radiogoniometer
167,266	3/5/20	12,231/20	Edison Swan Elec. Co., Ltd., and J. Scott-Taggart	Arrangement of electrodes in valves
167,561	7/5/20	12,718/20	B.T.H. Co., Ltd., and G.E.C. of America	Thermionic valves magnetically controlled
167,567	8/5/20	12,808/20	B.T.H. Co., Ltd., and G.E.C. of America	Thermionic valve transmitters
167,584	11/5/20	13,086/20	A. K. Macrorie and G. Shearing	Aerial insulation
168,072	25/5/20	18,257/19	J. B. Bolitho	Selective receiving system
168,107	22/4/20	11,242/20	Igranic Elec. Co., Ltd., and Cutler Hammer Manufacturing Co.	Valve relays
168,249	1/9/20	25,172/20	W. W. Burnham ..	Inductances
168,394	29/5/20	14,680/20	J. Scott-Taggart and Radio Communication Co., Ltd.	Relays in combination with valves
168,407	31/5/20	14,807/20	A. K. Macrorie, H. Morris-Airey and G. Shearing	Support for filaments in valves

NOTE.—The above list of British patents includes those published between October 22nd, 1920, and September 29th, 1921.

NAME INDEX TO BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1921

NAME INDEX TO BRITISH PATENT SPECIFICATIONS PUBLISHED DURING 1921 (*continued*).

U.S.A. PATENT SPECIFICATIONS PUBLISHED DURING 1921

Specification No.	Date of Application.	Patentee.	Assignee.	Subject.
1,357,657	21/9/18	E. O. Scriven ..	Western Elec. Co...	Generators of low frequency
1,357,710	29/11/18	W. K. Kearsley	General Elec. Co...	Apparatus for removing gases from vacuum tubes
1,358,143	30/8/18	L. F. Fuller ..	Federal Telegraph Co.	Signalling with C.W. transmitters
1,358,144	14/4/19	L. F. Fuller ..	A. Taylor	Method of signalling with arc generators in parallel
1,359,310	24/6/18	J. J. Amyynger	—	Detector condenser
1,359,979	3/1/20	C. S. Franklin ..	Radio Corporation of of America	Aerial system
1,360,126	26/5/17	D. G. McCaa ..	—	Signalling with C.W. transmitters
1,360,167	13/9/17	E. F. W. Alexanderson	G.E.C. of America ..	Aerial system
1,360,168	15/2/18	E. F. W. Alexanderson	G.E.C. of America ..	Aerial system
1,360,169	24/12/18	E. F. W. Alexanderson	G.E.C. of America ..	Aerial system
1,360,740	8/9/17	R. V. L. Hartley	Western Elec. Co...	Means for reducing speech distortion
1,361,099	21/5/20	H. J. Round ..	Radio Corporation of America	Means for cooling anode of valve
1,361,487	6/1/20	H. S. Osborne ..	American Telegraph & Telephone Co.	Means for selecting desired frequencies in radio-signalling
1,361,813	19/7/17	W. E. Booth ..	Western Elec. Co...	Cabinet for transmitting and receiving set
1,362,059	28/9/17	P. Thomas ..	Westinghouse Elec. and Mnfg. Co.	Condenser
1,362,383	19/4/19	W. E. Beakes ..	United Fruit Co. ..	Aerials in the shape of coils buried under the ground
1,362,612	15/5/16	L. Espenschied	American Telephone and Telegraph Co.	Method of eliminating interference
1,363,032	19/12/19	E. Bancroft ..	—	Wireless synchroniser
1,363,319	14/7/16 15/2/18	J. L. Hogan, jr.	S. M. Kintner and H. M. Barrett	Reception by the method of interference
1,364,495	26/8/20	H. J. Round and W. T. Ditcham	Radio Corporation of America	Signalling with C.W. transmitters
1,365,157	3/2/16	L. de Forest ..	De Forest Radio Telephone and Telegraph Co.	Cathodes for valves
1,365,292	18/4/19	P. Thomas ..	Westinghouse Elec. and Mnfg. Co.	Condensers
1,365,576	11/10/17	W. C. White ..	General Elec. Co. ..	Valves as detectors
1,365,579	14/6/19	T. Appleby and L. M. Knoll	C. D. Ehret ..	Aerials buried under the ground or submerged
1,365,734	18/3/19	S. P. Shackleton	American Telephone and Telegraph Co.	Electron-tube-testing apparatus
1,365,787	2/8/15	F. K. Kroger ..	International Radio Telegraph Co.	Quenched spark transmitters
1,365,926	21/10/19	T. M. Libby ..	H. G. Cordes ..	Method of eliminating interference
1,365,977	18/6/17	L. F. Fuller ..	United States of America	Signalling with arc transmitters
1,366,160	8/5/16	A. J. Kloneck	—	Rotary spark-gap
1,366,311	26/6/18	F. Cutting and B. Washington	—	Interrupter shunted across spark-gap for producing oscillations
1,366,411	19/2/16	A. McLean Nicolson	Western Elec. Co...	Valves with two filaments and two plates
,366,830	19/12/17	F. E. Pernot ..	G. L. Greves ..	Frequency-selector receiving-circuit
,366,953	13/10/19	H. K. Sandell ..	H. S. Mills . ..	Valves as detectors and amplifiers
367,165	21/7/19	H. Pratt ..	—	Recorder
367,224	5/1/16	L. de F. Arnold	Western Elec. Co...	Method of eliminating atmospherics

U.S.A. PATENT SPECIFICATIONS PUBLISHED DURING 1921 *(continued).*

Specification No.	Date of Application.	Patentee.	Assignee.	Subject.
1,369,281	4/11/18 19/1/21	O. C. Roos ..	—	Signalling with arc transmitters
1,369,781	20/2/18	T. W. Case ..	—	Light-rays signalling system
1,370,093	10/3/19	G. B. Crouse and I. H. Mills	Sperry Gyroscope Co.	Receiver panels
1,370,504	30/11/12 23/7/20	J. H. Hammond, jr.	—	Tele-stereotypy
1,370,688	22/1/14 22/5/20	J. H. Hammond, jr.	—	Control of moving bodies by wireless
1,370,735	30/9/20	C. S. Franklin..	Radio Corporation of America	Aerial system
1,371,061	29/3/19	C. D. Tuska ..	—	Condenser
1,371,228	8/10/17	A. M. Curtis ..	Western Elec. Co...	Wave filters for reducing atmospherics
1,371,567	26/12/16 22/9/20	R. H. Marriott	—	Method of eliminating atmospherics
1,371,757	7/10/20	E. W. B. Gill..	Radio Corporation of America	Valve as current limiting device
1,372,202	7/10/16	I. Shoenberg..	Radio Corporation of America	Frequency multiplier
1,372,203	7/10/16 12/2/19	I. Shoenberg..	Radio Corporation of America	Frequency multiplier
1,372,425	15/6/12 5/2/19	J. H. Hammond jr.	—	Simultaneous transmission and reception of a plurality of messages
1,372,426	29/5/12 15/3/19	J. H. Hammond jr.	—	Multiple telephony with arc generators
1,372,658	11/4/19	E. T. Jones ..	—	Aerials buried under the ground or submerged
1,372,808	1/4/18	A. L. Golden ..	—	Discharger immersed in liquids
1,373,504	11/9/18	H. W. Hitchcock	American Telephone and Telegraph Co.	Variable condenser
1,373,612	19/3/19	E. C. Hanson..	—	Aerials contained in conduits buried under the ground
1,373,710	24/10/19	V. J. F. Bouchardon	—	Method of switching over from spark to valve transmitting set
1,373,931	5/6/19	E. F. W. Alexanderson	General Elec. Co...	Reception of C.W.
1,374,170	27/3/16	A. J. Kloneck	—	Generating system for H.F. currents
1,374,293	28/7/19	R. A. Fessenden	—	Direction finder
1,374,679	15/3/20	J. B. Pratt ..	General Elec. Co...	Means for removing gases in vacuum tubes
1,374,832	27/9/19	H. P. Donle ..	Connecticut Telephone and Elec. Co.	Vacuum-tube base
1,375,481	4/11/16	H. de F. Arnold	Western Elec. Co...	Power modulators with valves
1,375,982	16/11/16	E. Thomson ..	General Elec. Co...	Condenser
1,375,992	18/4/19	E. F. W. Alexanderson	General Elec. Co...	Directional receiving system
1,376,051	10/4/19	A. H. Taylor..	—	Simultaneous transmission or reception of speech or signals
1,376,192	8/11/18	G. J. Dye ..	—	Radio aerial torpedo
1,376,679	10/10/17	A. M. Curtis ..	Western Elec. Co...	Means for reducing atmospheric disturbances in receivers
1,377,059	26/6/18	B. Washington and F. Cutting	—	Quenched spark-gap system
1,377,129	2/1/15	W. Hahnemann	Signal Gesellschaft	W.T. beneath water by means of very high frequences
1,378,345	31/5/19	R. F. Hall ..	Research Corporation	Relays
1,378,982	17/9/18	H. E. Shreeve..	Western Elec. Co...	Linking land lines to radio station
1,379,144	8/2/18	P. Ware ..	Ware Radio Inc...	Duplex
1,379,166	22/1/18	T. W. Case ..	—	Radiant-energy signalling system
1,379,167	20/2/18	T. W. Case ..	—	Detectors in the form of a gas-filled bulb with three electrodes
1,379,184	1/11/17	L. A. Hazeltine	Ware Radio Inc...	Shielding radio apparatus
1,379,262	16/9/19	S. C. Hooper and G. H. Clark	—	Aerial system
1,379,541	29/10/19	J. Erskine-Murray and J. Robinson	—	Direction finders

.A. PATENT SPECIFICATIONS PUBLISHED DURING 1921 *(continued)*.

Specification No.	Date of Application.	Patentee.	Assignee	Subject.
1,379,589	5/6/18	H. H. Hyder ..	—	Exploding mines by wireless control
1,379,706	10/3/17	R. A. Weagant	Radio Corporation of America	Valve with electrode placed outside evacuated vessel
1,380 206	10/3/17	R. A. Weagant	Radio Corporation of America	Valve with electrode placed outside evacuated vessel
1,380,663	16/5/18	J. Lindgren ..	-	Wireless distant-control device
1,380,872	24/9/17	R. E. Thompson	-	Quenched spark-gap transmitter
1,381,089	20/4/20	H. H. Beverage	General Elec. Co...	Directional aerial system
1,381,626	19/1/18	L. F. Fuller ..	Federal Telegr. Co.	Frequency changer
1,381,692	12/4/19	C. Bardeloni ..	--	Crystal detectors combined with valves for reception
1,382,177	10/7/16	W. Dubilier and P. Dubilier	Sperry Gyroscope Co.	Quenched spark-gap transmitter
1,382,590	3/1/20	W. G. Zeigler..	—	Submarine wireless system
1,382,786	3/6/16	A. J. Kloneck..	—	Rotary spark-gap
1,384,108	9/4/14	R. A. Weagant	Radio Corporation of America	Valves as generators
1,384,523	1/11/19	A. A. Hall ..	—	W.T. without aerials
1,385,090	19/2/16	J. Mills ..	Western Elec. Co. ..	Method of eliminating disturbances
1,385,091	25/9/16	J. Mills ..	Western Elec. Co...	Method of eliminating disturbances
1,385,121	23/3/20	H. F. Elliott ..	A. Taylor	Means for keeping arc steady
1,385,379	26/1/17	F. Kratz ..	American Bosch Magneto Corpor.	Condensers
1,385,818	14/6/19	C. L. Farrand..	Radio Corporation of America	Valve with two grids and tow plates
1,385,873	5/6/16	A. W. Hull ..	General Elec. Co...	Dynatron: valve with negative resistance
1,386,830	5/8/15	E. F. W. Alexanderson	General Elec. Co...	Radio frequency generator
1,386,840	29/11/19	R. C. Clinker..	General Elec. Co...	Portable receivers
1,387,262	30/9/15	R. V. L. Hartley	Western Elec. Co...	Reception by the method of interference
1,387,736	8/3/20	J. H. Rogers..	—	Submarine signalling
1,387,850	7/6/12 18/1/21	J. H. Hammond. jr.	—	Control of moving bodies by wireless
1,387,885	9/3/18	W. R. Davis	W. H. Dunwoody, Industrial Institute	Method of teaching Morse in class-rooms
1,387,984	30/8/15	A. W. Hull ..	General Elec. Co...	"Dynatron"
1,387,985	13/11/16	A. W. Hull ..	General Elec. Co...	"Dynatron"
1,387,986	10/3/17	A. W. Hull ..	General Elec. Co...	"Dynatron"
1,388,336	25/2/19	E. C. Hanson..	—	Aerials buried under the ground or submerged
1,388,441	1/10/15 14/1/21	M. I. Pupin and E. H. Armstrong	—	Method of screening antennae from atmospherics
1,388,450	3/9/15 13/1/21	E. H. Colpitts and H. de F. Arnold	Western Elec. Co...	Modulators with valves
1,388,793	5/1/17	W. T. Birdsall..	Westinghouse Lamp Co.	Vacuum-tubes as rectifiers
1,388,834	19/1/18	F. Lowenstein..	—	Quenched spark-gap transmitters
1,388,936	28/4/20	H. St. J. de A. Donisthorpe	—	Portable receivers
1,388,949	4/6/18	E. C. Hanson..	Title Insurance and Trust Co.	Means for navigating vessels through tortuous channels
1,389,026	19/5/20	V. Bush. ..	American Radio and Research Corporation	Reception of C.W.
1,389,255	16/5/17	L. R. McDonald	W. J. O'Leary ..	Inductance and capacity element
1,389,351	7/5/18	C. H. Harvey..	General Elec. Co., Ltd.	Means for supporting electrodes in valves
1,389,800	1/2/18	R. A. Weagant	Radio Corporation of America	Means for eliminating atmospherics
1,390,288	21/7/13 24/1/21	J. H. Hammond, jr.	—	Controlling moving bodies by wireless
1,390,883	5/4/18	T. W. Case .	—	Radiant-energy detecting device
1,391,671	23/3/21	H. St. J. de A. Donisthorpe	—	Valve with hemi spherical electrodes
1,391,672	1/8/18	W. Dubilier ..	--	Condensers
1,391,673	7/3/19 5/3/21	W. Dubilier ..	Dubilier Condenser Co.	Condensers

U.S.A. PATENT SPECIFICATIONS PUBLISHED DURING 1921 (*continued*).

Specification No.	Date of Application.	Patentee.	Assignee.	Subject.
1,391,836	25/10/20	G. Klem ..	—	Aerials for submarines
1,391,855	28/11/19	H. K. Sandell	H. S. Mills	C.W. Transmitters
1,393,018	9/3/16	P. C. Hewitt..	—	Valve with two cathodes
1,393,077	8/10/18	W. C. Brinton, jr.	Philbrin Corporation	Condenser
1,393,369	12/3/15	P. C. Hewitt ..	—	Apparatus for translating electric variations
1,393,594	3/6/18	W. C. White ..	General Elec. Co...	Valve as amplifier
1,394,026	2/4/20	L. M. Knoll ..	T. Appleby ..	Directional aerial system
1,394,056	3/7/20	W. C. White ..	General Elec. Co...	Modulators with valves
1,394,090	19/5/19	C. E. Hiatt and W. J. Davis	—	Means for supporting electrodes of valves
1,394,560	27/11/16	F. A. Kolster	—	Directional aerial system
1,394,600	8/6/16	G. M. Wright..	Radio Corporation of America	Method of eliminating atmospherics
1,395,378	29/9/19	J. P. Schafer & R. H. Wilson	Western Elec. Co...	Secret system of radio signalling
1,395,390	30/9/18	L. M. Clement	Western Elec. Co...	C.W. Transmitter
1,395,454	9/3/20 12/9/21	J. H. Rogers ..	—	Submarine signalling
1,395,931	17/5/20	C. F. Smith and W. H. Smith	—	Condenser
1,395,987	24/3/21	H. J. Round ..	Radio Corporation of America	Means for keeping wavelength constant in C.W. transmitters

NOTE.—The above list of U.S.A. patents includes those published between October 27th, 1920, and November 30th, 1921.

NAME INDEX TO U.S.A. PATENT SPECIFICATIONS PUBLISHED DURING 1921

NAME INDEX TO U.S.A. PATENT SPECIFICATIONS PUBLISHED DURING 1921 (*continued*).

AVIATION SECTION

(A) The Progress in Wireless Telephony in Aircraft.

(B) Tabular List of Aviation Stations.

(C) Aircraft fitted with Wireless Telephony.

(D) Marking of Aircraft.

(E) Table of Marks.

(F) General Information.

THE PROGRESS OF WIRELESS TELEPHONY IN AIRCRAFT.

BY H. C. VAN DE VELDE.

IN the "Year Book" of 1920, Major Prince, towards the end of his article, "Wireless Telephony and its Application to Aircraft," indicated the lines on which wireless apparatus in aircraft would possibly develop. It is the purpose of this article to describe the progress which has taken place since that date; to give some idea of the problems which confront wireless engineers who are about to provide wireless telephone facilities for the modern aeroplane; and finally, to give a general idea of the trend of modern research work in relation to wireless telephony in aircraft for the future.

Late in 1919, intensive work was being carried out with a view to providing a "fool-proof" wireless telephone for aircraft, and at the end of that year two machines, namely, the Airco "G-EALU" and the Handley-Page "G-EALX," were equipped with what was then the most modern apparatus. This apparatus, although sound in principle, was far from being a commercial proposition, since a number of problems which were inherent from a wireless point of view to aircraft, had still to be tackled. These machines were fitted with a transmitter, which gave very good results indeed, and except for questions of detail the circuits employed in that set are still used in up-to-date apparatus. Totally different results, however, were obtained with the receiver. This employed three valves—a detector, and two note magnifiers—and had a plain aerial circuit with a small range of variation of wavelength by means of a variometer. Reaction was provided in the normal manner, by coupling the anode circuit of the detector valve back into the aerial circuit, and no provision was made for remote control. The design of the set also rendered it peculiarly susceptible to interference from the ignition system of the aeroplane.

At that time, very little was understood regarding this problem, and although many efforts at a solution had been made, all had proved abortive In consequence, considerable interference was caused with incoming speech, and in order to obtain fair ranges, a set had to be worked so near to reaction point that the consequent distortion produced rendered it very difficult to understand what was being said. In fact, to any but a very practiced operator, the distortion precluded any possibility of the speech being understood.

The natural limitations of the receiver rendered it, therefore, impossible to obtain any but quite short ranges, something in the neighbourhood of between 20 and 30 miles as a maximum.

Early in 1920, however, a five-valve receiver was designed, and with its birth the results obtained exceeded all expectations. From the moment the first sample was tested on the Marconi aeroplane "G-EAAB" at Croydon Aerodrome, it was realised that good reception of telephony in the air was a *fait accompli*. In machines where it had been impossible to work at all before, owing to distortion and the interference from the magnetos, it was now possible to instal a set and obtain first-class results. Where formerly it had been difficult to obtain understandable speech at short ranges, it became a common occurrence to obtain good readable signals up to ranges of 150 to 200 miles with perfect ease.

Every step was taken to instal this receiver on the machines flying on the London-Paris Airway, and the results obtained were so excellent that the Aircraft Transport Companies then functioning on this route had the whole of their machines equipped and successfully working by the end of 1920.

Reference to "Aircraft Fitted with Wireless Telephony," in the 1921 "Year Book" will show that no less than fourteen machines were then fitted, a fact which in itself speaks volumes, when it is considered under what difficulties Aircraft Companies were labouring.

In order to incorporate a number of improvements which had been effected during the experience gained on aircraft during 1920, the Marconi Company at the latter end of the year produced the A.D.2. This set differed in few respects from the A.D.1 and A.D.3, employed up to that time, except that in the case of the A.D.2, the transmitter and receiver were fitted together in one box and the principle of the generator supplying all the current for the set was incorporated.

A small battery was still employed, but its only purpose was to provide the means of regulating the generator, the perfectly regulated generator having not yet been designed. This generator supplied all the necessary high tension current for the transmitting valves and the low tension current for the filaments of the transmitting and receiving valves.

During 1921, every British machine regularly flying on the London-Paris air route was equipped with the A.D.2, and the results obtained have been truly remarkable.

On several occasions machines have been directed to the London Aerodrome by means of the direction-finding facilities provided at the aerodrome station at Croydon, through thick fog and exceedingly bad weather. This fact alone illustrates the value of wireless communication with aircraft, as on each occasion these machines were filled with passengers, and in all probability, had no wireless facilities existed, bad "crashes," with possible loss of life, might have been occasioned.

The ranges daily obtained from the aircraft to the ground have always been of the order of something over a hundred miles, and in numerous instances the machines have been heard speaking immediately they ascended from the Paris Aerodrome, a distance of approximately 240 miles.

A special maintenance organisation has been set up under the direction of Captain Furnival at Croydon Aerodrome, and it is due largely to his highly specialised staff that the failures occurring have been something in the order of less than 5 per cent of the total number of flights made. When it is considered under what extraordinarily bad conditions the wireless telephone works in aircraft, and also the fact that the whole of the installations are handled by non-technical personnel, *i.e.*, the pilots and engine mechanics, it speaks volumes for the efficiency of the sets and the maintenance system. that the failures figure is so small.

The following is a list of machines which have been fitted in all parts of the world since the Armistice with Marconi Wireless Telephones. A total of between 50 and 60 have been equipped of the following types :—

D.H.6.
D.H.9.
D.H.16.
D.H.18.
D.H.29.
Handley Page 0/400.
Handley Page Super.
Handley Page W.8.
Handley Page Flying Boat.
Avro 2-seater.
Avro Seaplane.
Parnall Panther.
Bristol 10-seater.
Bristol Fighter.
F.5 Flying Boat.
Westland 6-seater.
Westland 4-seater.
Vickers-Vimy.
Farman-Goliath.
Ansaldo.
Brandenburg Seaplane.

It will be immediately realised that with such an assorted and varied number of types of machines, the installing of wireless telephones cannot under any sense be standardised, but on the contrary, each and every machine has to be treated as a special case. It is therefore proposed to outline a few of the problems which are involved when about to provide a wireless telephone in an aeroplane.

PROBLEMS INVOLVED WHEN INSTALLING A WIRELESS TELEPHONE IN AIRCRAFT.

When a ground or ship station is to be erected, certain fixed constants, such as length and height of aerial, power supply, characteristics of the surroundings, and above all, the space for the installation of the apparatus, can be ascertained and worked to. When equipping an aeroplane, no such constants can be given, and it is not until after inspection of the craft is made that the engineer can even approximately guess the problems which have to be overcome.

Firstly, there is generally the ever present magneto disturbance which has to be overcome before the installation can hope to be successful. For the benefit of those readers who know little or nothing about aircraft wireless, a few words on "Mag noise," as it is commonly called, will not be amiss.

In a modern high-power aeroplane, such as a Handley Page or Vickers-Vimy, there are two engines, each with twelve cylinders and four magnetos. Each of these magnetos is arranged to cause sparks in six cylinders, and for safety's sake the ignition system is duplicated, so that if one magneto fails the other carries on and no engine failure results.

There are, therefore, two lengths of wire from the magnetos to the two sparking plugs in each cylinder. At the proper moment when the primary coil of the magneto is broken at the "Make and Break," the potential builds up at the points of the plug to some thousands of volts, until it is high enough to overcome the resistance of the gap. A spark then passes and an oscillatory discharge takes place. It will thus be seen that in the ignition system of each cylinder of an aeroplane engine there is, in effect, a Hertzian oscillator. A condenser, formed by the capacity of the wires to the engine frame; inductance—of the leads themselves—and a spark gap, *i.e.*, a complete wireless transmitter in miniature.

The waves radiated are of high frequency and extremely short wavelength. It will thus be appreciated that each engine has twenty-four of these miniature transmitters all radiating these waves. If, therefore, a sensitive receiver is to be installed, there is first and foremost the problem of reducing to silence these 48 miniature transmitters. Owing to the nature of the waves radiated, it is impossible to tune these out any more than it would be possible to tune out a feeble plain aerial spark transmitter working at close quarters, or atmospherics to which they closely approximate.

As a result, a limitation is imposed on the sensitiveness and magnifying power of the receiving apparatus, and consequently, on the range which can be obtained from the aeroplane to any wireless station with which it is desired to communicate. The only satisfactory way of eliminating this trouble is by screening, *i.e.*, enclosing the ignition system in a complete metal screen. This can be carried out in two different ways:—

1. One method is to surround completely the engine with a metal cowling. This in many cases is partially done by the engine designers, but it is an extremely difficult job on some engines, where, for instance, the cylinders project through the top of the cowling provided. On twin-engined machines, such as the Handley Page or Vickers-Vimy, the engines are completely enclosed, or nearly so, but it is necessary in cases of this description to braid all the wires leading to the starting magnetos and switches.

   This system of overcoming magneto interference is usually sufficient where the degree of magnification being employed is not very high, but it is not always satisfactory, since the smallest space left unscreened enables the waves to escape and cause interference almost as badly as if no screening were employed.

2. The second method is to screen completely, or enclose in metal, the whole of the component parts of the magneto system. This is a much more simple method when it is carried out while the engine is being built, and before it is installed in the aeroplane, but a very different

matter when once the machine is completed without it, as those who have seen the amazing complication of an aero engine will realise.

A complete specification for carrying out this work has recently been issued by the Marconi Company, which ensures that no magneto noise will exist on machines where their system is employed. The principle employed in this specification is, firstly, to wire the engine with special copper braided ignition wire; secondly, to provide an effective screened aero plug, which has been designed in conjunction with the Robinhood Engineering Works, the well-known K.L.G. manufacturers, and thirdly, totally to enclose the magnetos with an iron cover on which a coating of copper has been deposited.

With this system it is possible to employ any degree of magnification, and also to work on extremely short waves, a thing which has been impossible in the past, owing to the wavelength of the radiations from the ignition system.

Having satisfied his mind on the foregoing problem, the engineer surveys the machine on which is to be installed the wireless telephone set.

For the aerial system, instead of the usual antenna supported on masts, which is common practice on ground and ship stations, the antenna on an aeroplane consists of a length of wire trailing from the machine in flight, the usual length employed being 100 to 250 feet, according to the character of the machine and requirements of the service. Provision has to be made for the aerial to be wound up when the machine is about to land or take off. For this purpose a winch has to be employed and a position must be selected so that the pilot can operate it without interfering with the flying controls of the machine. This occasionally is not an easy matter. Size is often the deciding factor in the installation of the winch. The very latest idea in aircraft winches recently patented by the Marconi Company is quite small, and, moreover, has no spinning handle while the aerial is running out. One handle is employed, which, by means of special mechanism, performs three functions, viz., when pulled backwards it allows the aerial to run out, while in the neutral position it acts as a brake or lock, and when rotated in the usual manner winds in the aerial. It is, therefore, easily operated with one hand and installed in the smallest possible space, making it an ideal winch for a machine on which the pilot has to operate the wireless while flying his machine.

The next piece of apparatus to be installed is the "Fairlead." This approximates to the "leading in" insulator on a ground station, and is usually placed on the deck of the machine, so that the aerial may run straight down from the winch and out into space. This is, however, not always possible.

As a practical instance, the Vickers-Vimy "Commercial" may be quoted. This machine is admirably designed for transport work by the makers, so that in the event of a forced landing in the sea it has all the qualities of a boat and will float indefinitely.

Beneath the pilot's seat, near to which the winch must necessarily be installed, are petrol tanks, the combination of these two factors making it imperative that the fairlead should be taken out high up through the side of the machine. Unfortunately, just where the aerial should be taken through, is the tip of the whirling propeller, and unless some means is employed to prevent it, any slackness in the wire will be sucked in by the vacuum created by the propeller. To overcome this difficulty, a system of insulators is fitted down the side of the fuselage, and on to the undercarriage from which the aerial drops into space.

The insulators have to be joined with thick rubber tubing, so that in the remote event of the weight becoming detached through some unforeseen circumstances, the wire will not be pulled into the vacuum created by the propeller.

After the aerial system has been satisfactorily installed, the sets themselves have to be mounted. As described in the previous issue, sets for use on machines which are operated by the pilot are designed so that the controls can be placed on the dashboard, while the box containing the main apparatus can be put anywhere convenient. Often, however, the problem of finding space is a matter of considerable difficulty, and perhaps the only possibility will present itself at the extreme rear of the machine. Special fittings have

to be made, and generally the whole question of installing the sets may tax the ingenuity of the engineer to the utmost.

After the sets are fitted, the connecting wires to the remote controls have to be run, and here again very often extreme difficulty is encountered in finding an easy run for these wires, since the main set may be on one side of a bulk-head and the controls some distance away on the other.

Finally the power source—the high tension generator and battery—must be installed. The high tension generator must be fitted wherever convenient, and in designing and carrying out this, the wireless engineer usually works in consultation with the aeroplane designer.

A propeller suitable for the cruising speed of the machine must be obtained, and the installation is then ready for initial ground testing and subsequent air test.

The air test requires in itself highly technical and specialised treatment, since, firstly, the conditions under which these tests have to be made are all against the engineer, who has to make highly accurate and delicate adjustments under the most adverse conditions; and secondly, the fact that air testing is necessarily a very expensive item, and, therefore, the results obtained on the one flight must guarantee that no further flights will be required subsequently.

THE TREND OF THE SCIENCE OF AIRCRAFT WIRELESS.

With the continued improvement of the aeroplane and the efforts of the aeroplane designers to produce a machine capable of flying in any weather at all times, it is only to be expected that those interested in the design of aircraft wireless apparatus are devoting the whole of their energies to producing sets which will assist this work.

There can be no doubt that wireless will play a most important part in guaranteeing the safety of the aeroplane of the future engaged on long distance flights, often through fog over sea, miles away from land, when it will be impossible to obtain bearings for navigation by direct observation.

On the successful functioning of the "Wireless" may hang the lives of passengers and crew, and it is, therefore, the policy to produce apparatus which will be absolutely reliable under all conditions, and be of the utmost assistance in the safe navigation of the machine.

One of the most interesting developments, therefore, is the Aircraft Direction Finder (Type 14), just produced by the Marconi Company.

As a general rule, direction finding for aircraft purposes is effected by means of fixed apparatus at ground stations, the bearings obtained being transmitted to the machine.

In certain cases, however, as for example in airships or passenger aeroplanes, where space permits, mobile and self-contained equipment carried in the machine and operated independently from the latter's ordinary wireless installation may be used to advantage, especially where aircraft is intended to travel along non-organised air routes, without the proximity of suitably equipped ground stations.

With this in view, the Type 14 Direction Finder has been specially designed for use in aircraft. It is the outcome of extended experience, both in the science of direction finding and its particular application to aerial navigation.

General Features of Design.—In the design of this instrument, considerable attention has been given to three points—space and weight, screening, and simplicity of operation.

The weight has been brought to the lowest possible limit by the extensive use of light-weight woods, metals and alloys, whilst to ensure its equal distribution on the machine, the unit principle has been adopted, the space occupied being at the same time reduced to a minimum. The approximate weight of the complete installation is 30 lbs. 2 ozs.

Simplicity of operation forms an outstanding feature, and has been developed to such an extent as to render unnecessary highly skilled personnel.

Wavelengths.—The receiver is designed for a waverange of 600 to 1,000 metres, thus covering all the wavelengths normally required in aircraft wireless practice.

The Aerial System.—The size and shape of the two loops forming the aerial are governed entirely by local conditions.

From a wireless standpoint they should embrace as large an area as possible and be fastened rigidly in position. In cases where one of the loops is smaller than the other, its natural wavelength being consequently lower, use is made of an adjustable calibrating choke to provide the necessary balance. This choke consists of an air core coil with suitable tappings.

BRIEF DESCRIPTION OF THE COMPONENTS.

The Direction Finder.—From Fig. 1 it will be seen that the "field" coils A and B of the Direction Finder Component are connected in series with the loop aerials, while the calibrating choke is inserted in the smaller loop.

Within the fixed field coils is situate a rotatable "search" coil, connected to the primary winding of a transformer. Thus the two field coils, mounted at right angles the one to the other, form two independent primaries of a loose coupled high frequency transformer, the search coil being the secondary.

To the spindle of the search coil is fixed a circular metal disc, on which there are two arrows, engraved at right angles to each other. The disc is capable of rotating inside a circular scale calibrated from 0 to 360 degrees.

One arrow indicates the plane of the received signals, once the correct adjustments have been made, while the other, marked "Sense," can be used to select the actual positive bearing of the station from the two possible directions.

The Tuning Unit.—The Tuning Unit consists of a high-frequency transformer having two secondary windings and one primary, the aerial tuning condenser, aerial tuning inductance, phasing resistance, and "D.F. Sense" switch.

The transformer is for the purpose of transferring the energy received by the search coil to the amplifier circuit, either of the two secondaries, and the tuning condenser forming a closed oscillatory circuit.

In order to understand the function of the aerial tuning inductance and phasing resistance, it should be remembered that, quite apart from its well-known directional properties, a double-loop aerial system also oscillates as a whole with regard to earth under the action of the received signals. In other words, this form of direction finder aerial behaves as if it were composed of a directional portion and a non-directional one, the latter acting like a plain vertical aerial.

This second effect, which is made practically to disappear when "direction" finding only is required, is, on the contrary, utilised in combination with the first, to determine the "sense," as explained in a later paragraph.

By means of the vertical aerial inductance and the phasing resistance, the signals received by virtue of the vertical action of the aerial, are tuned in and sufficiently reduced so as to be equivalent to the directional action of the aerial, thus making possible the required phasing.

The Amplifier used.—This unit comprises eight valves, six acting as amplifiers, the seventh as a rectifier, and the remaining one as a note magnifier, all being interconnected by transformers.

On the left-hand side of the instrument is a potentiometer, which effects simultaneously the potential on the grids of all the amplifying valves. A small rheostat is also provided for controlling the brilliancy of the valve filaments.

METHOD OF OPERATION.

"D.F." Position.—As will be seen in Fig. 1, the action of placing the switch on the tuning unit in the "D.F." position connects to earth the midpoints of the field coils A. and B. Thus, the only way in which the high-frequency transformer (and subsequently the amplifier) can be influenced, is through the search coil.

The "frame" or "directional" action of the aerials is thus brought into play in the usual way. Each loop receives signals of maximum or minimum strength, according to whether the transmitting station lies in its own plane or in a plane at right angles, intermediate results being obtained

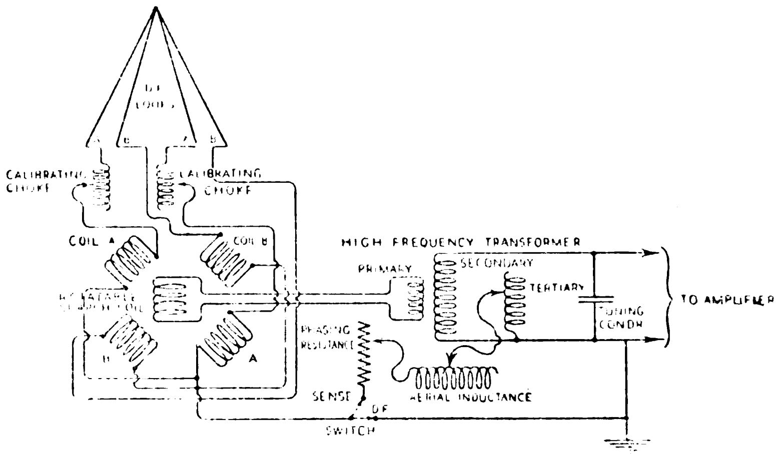


Fig. 1. Diagram of connections, Aircraft Direction Finder, Type 14.

in intermediate positions. The magnetic field set up by the fixed coils directly influenced by the loops, is of such a nature that maximum strength of signals is received by the search coil when it lies in the same plane as that of arrival of the received signals, minimum strength being obtained with the search coil in a position at right angles.

In practice, the minimum effect is used, and as the spindle of the search coil carries a disc rotatable inside the circular scale, readings can be taken by means of the unmarked arrow on the disc, once the handle has been swung round until signals are heard with minimum strength.

The polar curve showing the relationship between the strength of reception and the position of the search coil with regard to the direction of the transmitting station, is the well-known figure of eight shown in Fig. 2. From this diagram it will be seen that in the D.F. position two minima can be found, 180° apart on the scale, determining only the plane in which the signals sweep past the aerial.

It is therefore necessary to discriminate between the two, *i.e.*, to determine the "sense" of reception.

"*Sense*" *Position*. Placing the switch on the tuning unit in the "sense" position, brings into play the vertical action of the aerial, *i.e.*, its action with respect to earth.

In consequence of the comparatively small size of an aeroplane's frame aerial system, this non-directional effect is in itself of too great a magnitude to be combined with the directional action of the loops in the required manner, and it is necessary to reduce the current it produces; this is effected by means of the phasing resistance. (See Fig. 1.) The tuning circuit is now influenced by two distinct currents of equal potential but differing in phase.

Rotating the search coil so that the "sense" arrow is placed first to one of the minima found in the D.F. position, and then the other, will result in the practically total elimination of the signals at one of the two points, with a corresponding increase in the strength of those received at the other. Correct phasing has then been effected, resulting in subtraction of the two

effects referred to above in one-half of the 360° sweep, and their addition in the other half.

The polar curve obtained in this case is known as the "cardioid" or heart-shaped curve, and is shown in Fig. 2. The reading taken where the signals are weakest gives the positive bearing of the station received.

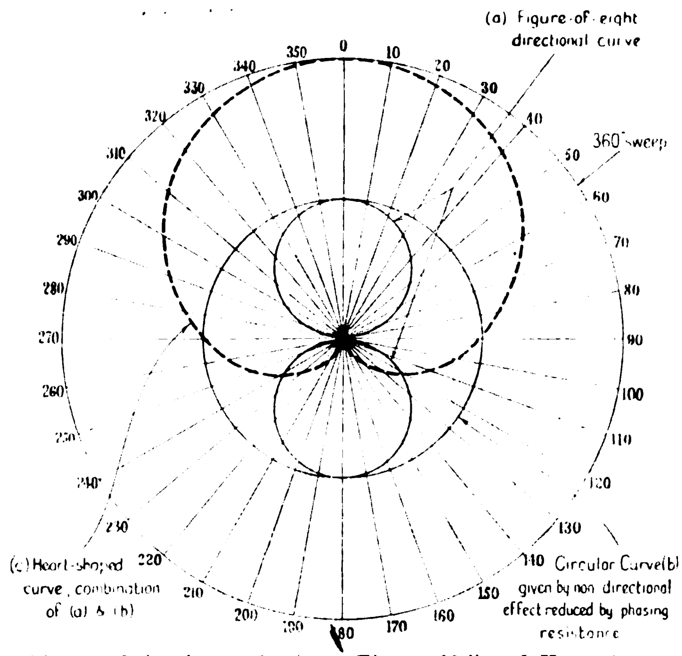


*Fig. 2. Polar Curves showing "**Figure of 8**" and Heart-shaped "Sense" Curve.*

It will thus be possible for a pilot using the installation to fly direct to the aerodrome for which he is making, or, alternatively, to work out his course by taking cross bearings on known stations not necessarily on aerodromes.

The provision of this apparatus will enable him to "make port" even though the ground may be totally obscured by low clouds or fog.

Having once arrived near to the aerodrome by this means, if fog is hanging around and over the landing ground, it will not be possible for him to use his direction finder in the normal manner, since the machine will be moving too fast for him accurately to determine his position.

Rudder Bar Direction Finding. A system is therefore being developed whereby the pilot may *automatically* direct his machine after he has arrived too close to the aerodrome to use the ordinary method of direction finding.

This system will also enable him to fly on a straight course through fogs or clouds, and tend to prevent the danger of getting into a "spin" when the horizon is obscured.

In brief, the principles of this system are :—

The search coil of the D.F. apparatus is coupled to the rudder bar, so that a small movement of that control in an anti-clockwise direction (thus turning the machine to the right) will move the search coil through a much larger arc in a clockwise direction, and *vice versa*.

Thus, assuming that the wireless telephone station is transmitting, and that the ordinary minimum method of D.F. is being employed, if the machine is flying directly towards the aerodrome, no signals will be heard.

If, however, the machine turns off its course, or the rudder is turned so that the machine tends to move off its course, the coil will also move, and as it moves over a larger arc, signals will immediately be heard, thus indicating to the pilot that he is going off his course.

All he then has to do is to move his rudder until signals fall to a minimum again, and by movement of his rudder bar keep the minimum constant.

This will automatically put his machine on the correct course for the aerodrome.

Where there is no wind, there would be no difficulty in flying straight to his destination and landing, but where there is a cross wind, it will be seen that opposing forces come into play. Whereas the automatic D.F. is endeavouring to take the machine straight to the aerodrome, the wind will tend to blow the machine off its course.

A little careful consideration will show that if the pilot uses his D.F. correctly, he will always keep his head towards the aerodrome, and ultimately land "up wind." Fig. 3 shows the resultant course when a wind is blowing directly across the line of flight.

Of course, this method would only be used when the machine is quite near the aerodrome, say from a maximum range of ten miles or so.

It is equally possible to use the maximum method in this manner, but, of course, in this case the pilot must fly on the maximum signal—the search coil being coupled to the rudder bar, at an angle of 90° to that employed on the minimum method. The maximum method has advantages, as the pilot would hear signals all the time he was on the right course, but, obviously, the indications are not as sharp or as accurate as when the minimum method is being employed.

There is no doubt when this system is put into general practice it will greatly assist towards "all-weather flying."

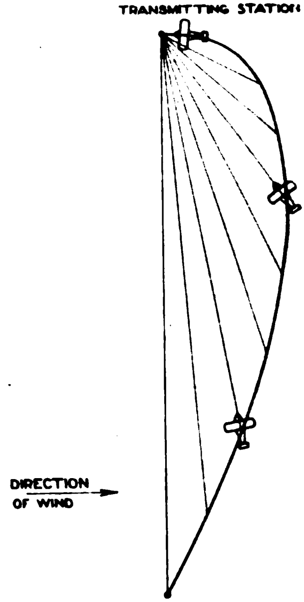


Fig. 3.—Diagram showing course of a machine using "Rudder Bar" Controlled D.F. when the wind is blowing at right angles to its course.

In conclusion, it is worth mentioning that a means has just been perfected and patented by the Marconi Company of eliminating high tension batteries for receiving valves. In the past, it has been the practice to provide a battery of dry cells for supplying the sheaths of the receiving valves with high tension. Now, however, owing to improvement in generator and receiving set design, it has become possible to use high tension direct from the generator for reception.

In the near future, after the wireless telephone has once been installed in the machine, it will be as reliable and as efficient as the ordinary land line, and will need no more attention than actually does the very much maligned Post Office instrument. A striking criticism of the efficiency already obtained is furnished by the pilot of a Cross-Channel Air Liner who complained recently, "What's the matter with the Wireless? I could only hear Croydon from Beauvais to-day!" (Croydon-Beauvais is approximately 160 miles.)

AVIATION STATIONS

Name.	Geographical Position.	Call Signal	Normal Range.	Controlled by	Wavelengths in Metres (the Normal Wavelength in heavy Type).	Nature of Service.	Hours of Service.	Charge. Per Word.	Charge. Minimum Charge.	Remarks.
								Francs.	Francs.	
BELGIUM										
Evère, Brussels ..	—	BAV	—	Belgian Government.	C.W. 900	—	—	—	—	
FRANCE										
Bordeaux [1]	44° 50′ 30″ N. 0° 42′ 00″ N.	AB	300 km	French Government	C.W. 1,400	—	—	—	—	[1] Not yet open for service
Le Bourget, Paris ..	48° 57′ 00″ N. 2° 25′ 00″ E.	ZM	800 km.	French Government	C.W. & R.T. 1,400, 900	—	0700 to 1900	—	—	
Lyons	45° 44′ 00″ N. 4° 53′ 00″ N.	AL	400 km.	French Government	C.W. 1,400	—	0700 to 1900	—	—	
Maubeuge [1]	—	AV	—	French Government	1,200	—	—	—	—	
Nimes	—	AN	300 km.	French Government	C.W. 1,400	—	0700 to 1900	—	—	
St. Inglevert	50° 53′ 00″ N. 1° 44′ 30″ E.	AM	400 km.	French Government	C.W. & R.T. 1,400, 900	—	0700 to 1900	—	—	
NETHERLANDS										
Soesterburg	—	STB	—	Dutch Government	C.W. & R.T. 900 & 1,400	—	—	—	—	
Schiphol (Amsterdam)	—	KLM	—	Dutch Government	C.W. & R.T. 900 & 1,400	—	—	—	—	
UNITED KINGDOM										
Castle Bromwich ..	—	GEC	—	—	C.W. or R.T. 900			—	—	
Croydon	—	GED	—	Air Ministry ..	C.W. or R.T. 1,400, 900	—	—			
Didsbury	—	GEM	—	—	C.W. or R.T. 900					

AVIATION STATIONS—*Continued*

Name.	Geographical Position.	Call Signal	Normal Range.	Controlled by	Wavelengths in Metres (the Normal Wavelength in heavy Type).	Nature of Service.	Hours of Service.	Charge. Per Word.	Charge. Minimum Charge.	Remarks.
								Francs	Francs	
UNITED KINGDOM —*contd.*										
Hinton-Admiral[1] ..	—	—	—	Air Ministry ..	C.W. or R.T. 900	—	—	—	—	[1] Oriental Mercantile Air Nav. Co. private aerodrome station. Not yet open for service
India House ..	—	GFA	—	Air Ministry ..	1,400 C.W.	O	—	—	—	
Lympne	—	GEG	—	—	C.W. or R.T. 900	—	—	—	—	
Renfrew	—	GER	—	—	C.W. or R.T. 900	—	—	—	—	
Writtle, Essex[2] ..	—	—	—	Marconi Company	—	—	—	—	—	[2] Experimental station.
UNITED STATES OF AMERICA ..										
Anacosta NSF* ..	District of Columbia	NSF	—	U.S. Navy ..	300, **600**	—	—	—	—	
Bellefonte	Pennsylvania	WWQ	—	Post Office Dept.	—	—	—	—	—	
Brunswick	Georgia	NOS	150	U.S. Navy ..	300, **600**	—	N	0.30	—	
Chatham NXA* ..	Massachusetts	NXA	—	U.S. Navy ..	300, **600**	—	N	0.30	—	
Chicago WWG ..	Illinois	WWG	—	Post Office Dept.	—	—	—	—	—	
Cleveland WWO ..	Ohio	WWO	—	Post Office Dept.	—	—	—	—	—	
College Park.. ..	Maryland	WWX	—	Post Office Dept.	—	—	—	—	—	
Fire Island NAG* ..	New York	NAG	—	U.S. Navy ..	300, **600**	—	—	—	—	
Fisherman's Island*	Virginia	NBF	150	U.S. Navy ..	300, **600**	—	N	—	—	
Hampton Roads* ..	Virginia	NAM	100	U.S. Navy ..	300, **600**	—	N	—	—	
Newark	New Jersey	WWU	—	Post Office Dept.	—	—	N	—	—	
Pensacola	Florida 30° 20′ 49″ N. 87° 16′ 06″ W.	NAS	150	U.S. Navy ..	300, **600**	—	N	—	—	
Rockaway Beach, New York	40° 34′ 05″ N. 73° 52′ [illegible]0″ W.	NAH	100	U.S. Navy ..	300, **600**	—	N	—	—	

Stations marked thus (*) are also open to General Public Services.

AIRCRAFT FITTED WITH WIRELESS TELEPHONY

Type of Aeroplane.	Call Signal.	Aircraft Owner	Wave-length.	Notes.
UNITED KINGDOM				
Handley Page	GEATM	Handley Page Transport, Ltd.	600, 900	
Handley Page	GEATH	Handley Page Transport, Ltd.	600, 900	
Handley Page	GEATN	Handley Page Transport, Ltd.	600, 900	
Handley Page	GEATK	Handley Page Transport, Ltd.	600, 900	
Handley Page	GEAPJ	Handley Page Transport, Ltd.	600, 900	
D.H. 18	GEARO	Instone Air Line	600, 900	
D.H. 18	GEAWO	Instone Air Line	600, 900	
D.H. 18	GEAWX	—	600, 900	
D.H. 18	*—	—	600, 900	
Vickers-Vimy	GEASI	Instone Air Line	600, 900	
Westland	GEAWF	Instone Air Line	600, 900	
Westland	GEARE	Westland Aircraft Co.	600, 900	
Bristol 10-seater	GEAWY	--	600, 900	
D.H. 29 Monoplan	*		600, 900	
D.H. 6	GEAAB	Marconi Company	600, 900	Experimental

* Markings not yet allotted.

THE MARKING OF AIRCRAFT

(*A*) The nationality mark shall be represented by capital letters in Roman characters—*e.g.*, France, F.

The registration mark shall be represented by a group of four capital letters; each group shall contain at least one vowel, and for this purpose the letter Y shall be considered as a vowel. The complete group of five letters shall be used as a call sign of the particular aircraft in making or receiving signals by wireless telegraphy or other methods of communication, except when opening up communication by means of visual signals, when the usual methods will be employed. The nationality and registration marks are assigned in accordance with the table.

(*B*) On aircraft other than State and commercial, the registration mark shall be underlined with a black line.

TABLE OF MARKS

The nationality mark of the State named below applies to the aircraft of its Dominions, Colonies, Protectorates, Dependencies, or of countries of which it is the Mandatory Power.

Country.	Nationality Mark.	Registration of Marks.
United States of America	N	All communications made in accordance with the provisions of Section 1 (*A*) using a group of four letters out of the 26 of the alphabet, each group containing at least one vowel—*e.g.*, ADCJ, PURN
British Empire	G	
France	F	
Italy	I	
Japan	J	
Bolivia	C	All communications made with B as first letter.
Cuba	C	,, ,, ,, C ,,
Portugal	C	,, ,, ,, P ,,
Roumania	C	,, ,, ,, R ,,
Uruguay	C	,, ,, ,, U ,,
Czecho-Slovakia	L	,, ,, ,, B ,,
Guatemala	L	,, ,, ,, G ,,
Liberia	L	,, ,, ,, L ,,
Brazil	P	,, ,, ,, B ,,
Poland	P	,, ,, ,, P ,,
Belgium	O	,, ,, ,, B ,,
Peru	O	,, ,, ,, P ,,
China	X	,, ,, ,, C ,,
Honduras	X	,, ,, ,, H ,,
Serbia-Croatia-Slavonia	X	,, ,, ,, S ,,
Haiti	H	,, ,, ,, H ,,
Siam	H	,, ,, ,, S ,,
Ecuador	E	,, ,, ,, E ,,
Greece	S	,, ,, ,, G ,,
Panama	S	,, ,, ,, P ,,
Hedjaz	A	,, ,, ,, H ,,

GENERAL INFORMATION

UNITED STATES OF AMERICA

The Military Air Service is controlled by the War Department of the United States. Below is copy of a letter of instruction from the Office of the Chief of Air Service, dated February 4th, 1920, outlining the indicatives or call letters assigned for the permanent use of the Air Service.

It is proposed, as a part of the 1922 Air Service projects, that long-distance wireless communications stations will be installed and used, both for inter-field communication and for the dissemination of meteorological data to aircraft. It is contemplated that these stations will be located at the following listed fields and stations :—

Mitchel Field, Mineola, L.I., N.Y.
Langley Field, Hampton, Va.
Carlstrom Field, Arcadia, Fla.
Ellington Field, Houston, Tex.
El Paso, Texas.
San Diego, Cal.
Crissy Field, Calif.
Camp Lewis, Wash.
Selfridge Field, Mt. Clemens, Mich.

The Signal Corps is planning the installation of radio stations throughout the United States, for the purpose of disseminating meteorological data to aircraft, which will be received by ground wire from the Weather Bureau officials.

WAR DEPARTMENT.

OFFICE OF THE DIRECTOR OF AIR SERVICE, WASHINGTON.

February 4th, 1920.

LETTER OF INSTRUCTION
No. 2.

To: RADIO OFFICERS, ALL AIR SERVICE ACTIVITIES.

Subject: Radio Call Letters, or Indicatives, for all Air Service Radio Stations.

1. A block of indicatives, or call letters, has been assigned for the permanent use of the Air Service. The indicatives are divided into five main divisions—*i.e.*, V, W, X, Y and Z. The indicatives are to be made up of two letters and one figure. The first letter of the indicative is to be one of the above letters. The five main divisions are assigned as follows:—

Western Department..	VA1 to VZø
Central Department	WA1 to WZø
Eastern and South-Eastern Department	XA1 to XZø
Insular Possessions	YA1 to YZø
Southern Department	ZA1 to ZZø

2. The indicatives will be effective at 00.1 o'clock on April 1st, 1920. Radio officers in charge of Air Service radio stations are responsible for the co-ordination of the change of indicatives with any stations with which they are working.

3. Indicatives for the squadrons will be assigned by the Group Radio Officer under which the squadron is operating, from the block of indicatives assigned to the Group, and indicatives for the airplanes of a squadron will be assigned by the squadron radio officer from the block of indicatives assigned the squadron by the Group Radio Officer.

4. As soon as the blocks of indicatives have been assigned the squadron by the Group Radio Officer, he will send a copy to the Wing Radio Officer, who, in turn, will submit a copy of complete assignment to this Office, through channels.

5. Attached are the assignments of indicatives for Departments, Fields, Wings and Groups, and the reserve indicatives allotted to each.

By direction of the Director of Air Service,

WM. F. PEARSON,
Colonel, A.S.A.,
Administrative Executive.

WESTERN DEPARTMENT.

VA1 to VZø

STATION.	CALL LETTERS.
Mather Field, Sacramento, California ..	VA1
(a) Reserve—for assignment to squadron and airplane ..	VA2 to VDø
Ross Field, Arcadia, California	VF1
(a) Reserve—for assignment to squadron and airplane ..	VF2 to VIø
March Field, Riverside, California ..	VK1
(a) Reserve—for assignment to squadron and airplane ..	VK2 to VPø

NOTE: ø signifies "zero."

WESTERN DEPARTMENT (*continued*).

STATION.	CALL LETTERS.
Rockwell Field, Coronado, California ..	VR1
(a) Reserve—for assignment to squadron and airplane ..	VR2 to VUø
Ream Field, Imperial Beach, San Diego, California	VW1
(a) Reserve—for assignment to squadron and airplane ..	VW2 to VXø

CENTRAL DEPARTMENT.

WA1 to WZø

STATION.	CALL LETTERS.
McCook Field, Dayton, Ohio	WA1
(a) Reserve—for assignment to squadron and airplane ..	WA2 to WBø
Post Field, Ft. Sill, Oklahoma	WC1
(a) Reserve—for assignment to squadron and airplane ..	WC2 to WHø
United States Army Balloon School, Ft. Omaha, Nebraska ..	WI1
(a) Reserve—for assignment to squadron and airplane ..	WI2 to WJø
Godman Field, Stithton, Kentucky ..	WK1
(a) Reserve—for assignment to squadron and airplane ..	WK2to WKø

EASTERN AND SOUTH-EASTERN DEPARTMENT.

XA1 to XZø

STATION.	CALL LETTERS.
Air Service, Washington, D.C.	XA1
(a) Reserve—for assignment to squadron and airplane ..	XA2 to XAø
Bolling Field, Washington D.C.	XB1
(a) Reserve—for assignment to squadron and airplane ..	XB2 to XDø
Langley Field, Hampton, Virginia ..	XF1
(a) Reserve—for assignment to squadron and airplane ..	XF2 to XJø
Mitchel Field, Mineola, L.I., N.Y... ..	XK1
(a) Reserve—for assignment to squadron and airplane ..	XK2 to XMø
Aberdeen Proving Grounds, Aberdeen, Md.	XN1
(a) Reserve—for assignment to squadron and airplane ..	XN2 to XOø
Carlstrom Field, Arcadia, Florida ..	XP1
(a) Reserve—for assignment to squadron and airplane ..	XP2 to XSø
Pope Field, Fayetteville, North Carolina..	XU1
(a) Reserve—for assignment to squadron and airplane ..	XU2 to XUø

NOTE: ø signifies "zero."

INSULAR POSSESSIONS.

YA1 to YZØ

STATION.		CALL LETTERS
Philippine Islands, A.S. Headquarters	..	YA1
(a) Reserve—for assignment squadron and airplane	to ..	YA2 to YFØ
Hawaiian Islands	..	YG1
(a) Reserve—for assignment squadron and airplane	to ..	YG2 to YKØ
Panama Canal Zone	..	YL1
(a) Reserve—for assignment squadron and airplane	to ..	YL2 to YPØ

SOUTHERN DEPARTMENT.

ZA1 to ZZØ

STATION.		CALL LETTERS.
Kelly Field, San Antonio, Texas	..	ZZ1
(a) Reserve—for assignment squadron and airplane	to ..	ZZ2 to ZZØ
First Wing Headquarters	..	ZA1
(a) Reserve—for assignment squadron and airplane	to ..	ZA2 to ZAØ
First Surveillance Group	..	ZB1
(a) Reserve—for assignment squadron and airplane	to ..	ZB2 to ZJØ
First Day Bombardment Group ..	..	ZK1
(a) Reserve—for assignment squadron and airplane	to ..	ZK2 to ZRØ
First Pursuit Group	..	ZS1
(a) Reserve—for assignment squadron and airplane	to ..	ZS2 to ZYØ

The Postal Radio Service is owned and operated by the Post Office Department.

The United States Air Mail Service has been experimenting with aircraft radio since February, 1919. Its principal efforts have been directed to the solution of the problem of Radio Direction Finding and Radio Field Localising. The solution of these problems has been pursued with the aid of the Bureau of Standards and data furnished by the Navy Department, with considerable original research by the Air Mail Service. A simplified Radio Direction Finder, based on the Robinson principle of fixed A and B coils, was evolved, and has been practically applied to single-manned planes of this service. Pilots with no previous experience have flown directly over the radio stations at destination by this means.

The problem of field localising jointly solved by the Air Mail Service and the Bureau of Standards, has resulted in the discovery and practical application of the so-called Radio Frequency Field Localiser System. This system, in brief, consists of two large horizontal single-turn coils in which radio frequency currents flow in opposite directions. As a result, the electro-magnetic field extends upward in an expanding cone. An aeroplane utilising radio direction finding during periods of poor visibility can, of course, fly to the vicinity of the landing field. From this point the field localiser directs them to the immediate vicinity of the field itself.

NOTE : Ø signifies "zero."

During August, 1920, it was found that telegraph communication could not be furnished for the trans-continental Air Mail Service. As a result, it was decided on August 20th to instal a chain of radio stations across the continent, tying in each of the Air Mail fields.

There are eleven of these stations installed on or near various Air Mail fields Those in operation are (1) College Park, Md. 2 kw. Quenched Spark, (2) Bellefonte, Pa. 5 kw. Quenched Spark, (3) Omaha, Neb., 5 kw. Quenched Spark, (4) Cheyenne, Wyo., 2 kw. Arc.

Stations located at the following points have been in operation since October 15th:—(1) Salt Lake City, Utah, 2 kw. Arc; (2) Elko, Nevada, 2 kw. Arc; (3) Reno, Nevada, 2 kw. Arc. The following stations were completed on November 1st, 1920:—(1) St. Louis, Mo., 5 kw. Quenched Spark; (2) North Platte, Nebr., 2 kw. Arc; (3) Rock Springs, Wyo., 2 kw. Arc.

These stations are not only used for inter-station traffic, but are also utilised for aeroplane radio communication and radio direction finding.

It is proposed to utilise all the radio stations of the Air Mail Service for Radio Research work, such as investigation of shifting signals, static and other kindred problems.

GERMANY

The Koenigs Wusterhausen Station (Call Letters, LP) sends out notices for aircraft on a 3,600-metre wave at 1010 and 2010.

Additional information relating to Aircraft Wireless is contained in the Laws and Regulations section.

USEFUL DATA
S E C T I O N

(A) Wireless Terminology : —

(i) Definitions.

(ii) Foreign Equivalents.

(B) General Information and Useful Tables.

USEFUL DATA
WIRELESS TERMINOLOGY
(i) DEFINITIONS.

NOTE.—Terms are generally arranged alphabetically according to the *noun* referred to.

1. AERIAL.—The system of conductors designed to radiate, or absorb electro-magnetic waves.

2. AERIAL CIRCUIT.—The circuit comprising the aerial conductors, the earth conductors, and all inductances and condensers connected between them. As the aerial wires possess capacity with respect to the earth and the aerial conductors themselves possess inductance the aerial circuit has a natural oscillation frequency.

3. AERIAL RESISTANCE.—(See Antenna Resistance.)

4. ÆTHER.—See Ether.

5. ALTERNATING CURRENT.—One which reverses its direction periodically with time, the " periodic time " being the interval between two successive maxima of current in the same direction.

6. ALTERNATOR.—A rotating machine which transforms mechanical energy into electrical energy, producing at its terminals one or more alternating E.M.F.'s (single phase or polyphase).

7. AMMETER (HOT BAND : HOT WIRE).—An ammeter dependent for its indications upon the change in dimensions of an element which is heated by a current through it. In most cases the expansion of the wire is measured by the alteration in the amount of sag.

8. AMMETER, THERMO.—An instrument for measuring current, depending for its indications on the voltage generated at the terminals of a thermo junction heated either directly or indirectly by the current to be measured.

9. AMPERE-TURN is a unit of magneto-motive force. It is $4\pi/10$ gauss. In a solenoid winding it is the product of amperes and number of turns.

10. AMPLIFIER OR AMPLIFYING RELAY.—An instrument which modifies the effect of a local source of energy in accordance with the variations of received energy; and in general produces a larger indication than could be had from the incoming energy alone. Most modern amplifiers consist of arrangements of three-electrode valves in cascade, the inter-valve connections being made by transformers, high resistances or condensers or by combinations of these.

11. AMPLIFIER, HIGH FREQUENCY.—An amplifier designed for the amplification of high or radio frequency oscillations. In a valve amplifier of this type air core transformers are commonly used as the inter-valve connections.

12. AMPLIFIER, LOW FREQUENCY.—An amplifier designed for the amplification of low or audio-frequency signals. In a valve amplifier of this type iron core transformers are commonly used as the inter-valve connections.

13. AMPLIFICATION, CO-EFFICIENT OF.—The ratio of the useful effect obtained by the employment of the amplifier to the useful effect obtained without that instrument. In particular the amplification constant of a thermionic valve may be defined as the ratio of the slopes of the grid voltage—anode current and the anode voltage—anode current characteristics at any operating point.

14. AMPLITUDE.—The maximum value of current or voltage attained during any half period of an alternating current or voltage is called the amplitude during that half period.

15. ANGULAR VELOCITY (or ANGULAR FREQUENCY).—Of a periodic alternating current or voltage is the product of 2π and the frequency in cycles per second.

16. ANODE.—(a) In an electrolytic cell. The conductor through which the current enters the liquid.

(b) In a primary cell. The metal (usually zinc) through which the current enters the electrolyte. It is also termed the negative terminal.

(c) The terminal by which the current enters a cell or other apparatus, such as a vacuum tube, thermionic valve, etc. In a thermionic valve the anode is often termed the "plate," or less commonly the "sheath."

17. ANODE CIRCUIT.—See Plate Circuit.

18. ANTENNA.—See Aerial.

19. ANTENNA, DIRECTIVE.—An antenna having the property of radiating a maximum energy in one (or more) directions.

20. ANTENNA, FLAT TOP.—An antenna having horizontal wires at the top covering a large area.

21. ANTENNA, HARP.—An antenna having an approximately vertical section of large area and considerable width.

22. ANTENNA, INVERTED L.—A flat top antenna in which the leading down wires are taken down from one end of the long horizontal section.

23. ANTENNA, LOOP.—An antenna in which the wires form a closed circuit part of which may be the ground.

24. ANTENNA, PLAIN.—An approximately vertical single wire.

25. ANTENNA, T.—A flat top antenna in which the horizontal section is long and narrow, the leading down wires being taken from the centre.

26. ANTENNA, UMBRELLA.—An antenna the conductors of which form the elements of a cone from the elevated apex of which the leading down wires are brought.

27. ANTENNA RESISTANCE.—Is that resistance which if inserted at the antinode of current in the antenna would dissipate the same power as that radiated by the antenna.

Antenna resistance includes:

(a) Radiation resistance.
(b) Ground or earth resistance.
(c) Radio frequency ohmic resistance of antenna and loading coil and shortening condensers.
(d) Equivalent resistance due to corona, eddy currents, and insulator leakage.
(e) Absorption in neighbouring imperfect dielectrics.

28. APERIODIC CIRCUIT.—A circuit which has no definite time period, this being due either to its resistance being large enough to prevent natural oscillations occurring or to its having no capacity or no inductance and therefore no oscillatory properties.

29. ARC.—"A luminous discharge of electricity through a gas in which the material of one or both the electrodes is volatilised and takes part in the conduction of the current, whether continuous or alternating" (B.E.C.). ARC.—The passage of an electric current of relatively high density through a gas or vapour the conductivity of which is mainly due to the electron emission from the self-heated cathode. Under present practical conditions the phenomena take place near atmospheric pressure (I.R.E.).

30. ARC OSCILLATOR.—An arc used with an oscillating circuit for the conversion of direct to alternating or pulsating current. The oscillations generated are classified as follows:—

Class (1).—Those in which the amplitude of the oscillation circuit current produced is less than the direct current through the arc.

Class (2).—Those in which the amplitude of the oscillation circuit current is at least equal to the direct current, but in which the direction of the current through the arc is never reversed.

Class (3).—Those in which the amplitude of the initial portion of the oscillation circuit current is greater than the direct current passing through the arc, and in which the direction of the current through the arc is periodically reversed.

31. ARRESTER, EARTH.—A spark gap with a small gap and large sparking surfaces; used to protect receiving apparatus from powerful discharges.

32. ASYNCHRONOUS.—" A term applied to an A.C. generator or motor, the speed of which has no fixed relation to the frequency of the current " (I.E.C.).

33. ATMOSPHERIC ABSORPTION.—That portion of the total loss of radiated energy due to atmospheric conductivity, reflection, and refraction.

34. ATMOSPHERICS.—Disturbances produced in the receiving circuits caused by electrical action in the atmosphere or in the earth's surface. They are also known as " X's," " Strays," or " Parasitic Signals," and in the U.S.A. as " Static."

35. ATTENUATION (RADIO).—This is the decrease, with distance from the radiating source, of the amplitude of the electric and magnetic forces constituting an electro-magnetic wave.

36. ATTENUATION, CO-EFFICIENT OF (RADIO).—The co-efficient, which when multiplied by the distance of transmission through a uniform medium, gives the natural logarithm of the ratio of the amplitude of the electric or magnetic force at that distance to the initial value of the corresponding quantity.

37. AUDIBILITY.—The ratio of the telephone current variation producing the received signal to that producing a just audible signal—*i.e.*, one which permits the mere differentiation of dots and dashes.

The measurement of audibility is an arbitrary method for determining the relative loudness of telephone response in radio receivers, in which it is stated that a signal has an audibility of given value. The determination of the above ratio may be made by placing a resistance in parallel with the telephone and reducing its value until the limit of audibility is reached. The audibility of the given signals is then given by $\frac{s+t}{s}$ where s is the impedance of the shunt and t the impedance of the telephone for the frequency and wave-form of the impulses through it.

38. AUTODYNE RECEPTION (also termed ENDODYNE RECEPTION).—A scheme of reception for continuous waves in which the receiver itself generates the local oscillations required for the production of a beat note with the incoming oscillations.

39. AUTO-JIGGER.—See Jigger.

40. AUTOMATIC RECEIVER.—A receiver which records signals so they can be translated at any convenient time after reception.

41. AUTO-TRANSFORMER.—A coil with a core of air or iron in which the primary and secondary windings have a number of turns in common.

42. AUTOMATIC TRANSMITTER.—A transmitter which has the usual operating key replaced by any mechanical telegraph sender such as a Wheatstone transmitter.

43. BALANCING AERIAL.—An aerial used in duplex wireless telegraphy. It fills a purpose similar to that of the artificial line in duplex wire telegraphy.

44. BATTERY.—A primary or secondary cell for producing electric current or a collection of such units. A collection of condenser units.

45. BEAT.—When two oscillations of slightly different frequencies are impressed on an electrical circuit they periodically help and oppose each other. The result is an oscillation the amplitude of which varies in a regular and periodic manner. The time between two successive maxima of amplitude is called the period of the beat. The beat frequency is equal to the difference of the frequencies of the component oscillations.

46. BLUE GLOW.—In a soft thermionic valve is the emission of light which accompanies intense ionisation by collision.

47. Brush Discharge.—"A discharge having a feathery form, and consisting of an intermittent partial discharge which takes place from a conductor when the potential difference exceeds a certain limit, but is not high enough to cause the formation of a true spark or arc. It is always accompanied by a hissing or cracking sound." (I.E.C.). When such a discharge is being given off by a conductor the latter is said to be "Brushing."

48. Brush or Coronal Losses.—Those due to leakage convection electric currents through a gaseous medium.

49. Buzzer.—A small mechanism (usually electromagnetic) used for rapidly making and breaking an electric circuit. When connected in series with part of a circuit in which oscillations are possible it continually impulses the circuit, thereby producing oscillations which are convenient for testing purposes.

50. Cage Conductor.—A group of parallel wires arranged as the elements of a long cylinder.

Note.—Any conducting element of an antenna may be a cage conductor.

51. Capacity.—That property of a material system by virtue of which it is capable of storing energy electrostatically. The capacity of a system is dependent on its geometrical dimensions, its position relative to other conductors and the dielectric constants of the surrounding media.

Capacity is measured by the ratio of the quantity of electricity stored to the potential difference at which it is stored.

A distinctive property of a capacity is that it permits the passage of electrical energy through it only in the form of displacement currents. The reactance of a capacity C for such currents is equal to $\frac{1}{Cp}$ where p is the angular frequency of the alternating current.

52. Capacity, Effective, of an Antenna.—The effective capacity and effective inductance of an antenna at any oscillation frequency are the equivalent capacity and inductance values determined from the following fundamental equations:

$$\omega = \sqrt{\frac{1}{LC}} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \qquad (1)$$

where L = the total antenna inductance.
C = the total antenna capacity,
ω = the angular velocity of the free alternating currents in the antenna

$$d = \pi R \sqrt{\frac{C}{L}} \quad . \quad . \quad . \quad . \quad . \qquad (2)$$

or

$$d' = \pi R' \sqrt{\frac{C}{L}} \quad . \quad . \quad . \quad . \quad . \qquad (2a)$$

where R' = series resistance inserted at the base of the antenna and
d' = increased decrement resulting therefrom.

Solving (1) and (2a) for L and C, we have

$$L = \frac{\pi R'}{\omega d'} = \frac{R'}{6 \times 10^8 \times d'} \cdot \lambda \qquad (\lambda \text{ in metres}).$$

$$C = \frac{d'}{R'} = \frac{d'}{6\pi^2 \times 10^8 \times R'} \cdot \lambda \qquad (\lambda \text{ in metres})$$

Having the antenna inductance and capacity, the resistance R of the antenna can be determined from equation (2). This value of R satisfies the fundamental equation :

RI^2 = power absorbed by the antenna,
where I = current measured at the base of the antenna.

NOTE.—The equation

$$I = \omega CE$$

$$\left(\text{and also } E = \frac{\pi R'}{d'} \cdot I\right)$$

defines an effective voltage E, which is the voltage approximately given by the equation. Energy per spark $= \frac{1}{2}CE^2$.

A useful approximate formula for the fundamental wavelength of an inverted L antenna is the following :

$$\lambda \text{ (metres)} = 1{,}884 \sqrt{\left(L + \frac{L_o}{3}\right) C_o}$$

where C_o is calculated static capacity,
L_o is ordinary calculated inductance in microhenries.
L is inductance of loading coil in microhenries.

53. CATHODE.—See Kathode.

54. CATHODE OF THERMIONIC VALVE.—See Filament.

55. CENTRE OF CAPACITY OF AN ANTENNA.—See Form Factor, Note 2.

56. CHANGER, FREQUENCY.—A device delivering alternating currents at a frequency which is some multiple of frequency of the supply current.

57. CHANGER, WAVE.—A transmitting device for rapidly and positively changing the wavelength.

58. CHARACTERISTIC CURVE.—A curve showing the variation of a property of a material or a piece of apparatus when submitted to a changing influence which produces that variation.

The characteristic curves of a thermionic valve or arc or crystal show the relations between the various applied potentials and resulting currents.

59. CHARACTERISTIC, DYNAMIC, OF A CONDUCTOR (for a given frequency and between given extremes of impressed E.M.F. and resultant current through the conductor).—This is the relation given by the curve obtained when the impressed E.M.F.'s are plotted as ordinates against the resultant currents as abscissas, both E.M.F.'s and currents varying at the given frequency and between the given extremes.

60. CHARACTERISTIC, STATIC, OF A CONDUCTOR.—This is the relation given by the curve plotted between the impressed electromotive force as ordinates and the resultant current through the conductor as abscissas, for substantially stationary conditions.

61. CHOKING COIL.—" A coil with so great a self-induction that its impedance depends chiefly on the self-induction rather than upon the resistance " (I.E.C.). Generally called a Reactance Coil in U.S.A.

62. CIRCUIT, CLOSED OSCILLATING.—A circuit in which the capacity and inductance in series are localised substantially in different places, and which has very small power of radiating electromagnetic waves.

63. CO-EFFICIENT, ATTENUATION, RADIO.—See Attenuation.

64. CO-EFFICIENT OF AMPLIFICATION.—See Amplification.

65. CO-EFFICIENT OF COUPLING, INDUCTIVE.—The ratio of the effective mutual inductance of two circuits to the square root of the product of the effective self-inductances of each of these circuits.

66. CODE.—A system of conventional characters designed to represent letters by dots and dashes. The International Morse Code is official.

67. COHERER.—A form of detector (q.v.). An imperfect contact or collection of such contacts so arranged that when under the influence of an alternating potential it coheres and allows current from a local battery to pass and make some kind of signal. A device sensitive to radio frequency energy, and characterised by (1) a normally high resistance to currents at low voltages, (2) a reduction in resistance on the application of an increasing electromotive force, this reduction persisting until eliminated by the application of a restoring or disturbing mechanical force, and (3) the substantial absence of thermo-electric or rectifying action.

68. COMMUNICATION RADIO.—The transmission of signals by means of electromagnetic waves originating in a constructed circuit.

69. COMPASS RADIO.—A radio receiving device for determining the direction (or the direction and its opposite) in which maximum energy is received ; or

A radio transmitting device for determining the direction (or the direction and its opposite) of maximum radiation.

70. CONDENSER.—A material system possessing electrostatic capacity. Two conducting surfaces separated by a dielectric.

71. CONDENSER, AIR.—A condenser having air as its dielectric.

72. CONDENSER, COMPRESSED GAS.—A condenser having compressed gas as its dielectric.

73. CONDUCTOR CAGE.—See Cage Conductor.

74. CONJUGATE MUTUAL CONDUCTANCE of a thermionic valve is given by the slope of the anode voltage-grid current characteristic at any operating point.

75. CONTINUOUS CURRENT.—A term recommended by the I.E.C. to supersede " direct current " as a description of " an electric current in one direction and sensibly steady or free from pulsation. Abbreviated CC."

76. CONTINUOUS WAVES.—The term applied to waves radiated from an aerial in which oscillations are sustained. Continuous waves may have successive half periods of equal amplitude, or the amplitude may vary within small limits without detriment to their use for wireless telegraphy.

77. CONTROL ELECTRODE OF THERMIONIC VALVE.—See Grid.

78. CONVECTION CURRENT.—A transfer of electrical energy by separate charged particles.

79. CONVERTER, ROTARY.—A machine for converting electrical energy of one form of current to electrical energy of another form, such as from alternating current to continuous or *vice versa.*

80. CORONA.—See Brush or Coronal Losses.

81. COUNTERPOISE.—A system of electrical conductors forming one portion of a radiating oscillator the other portion of which is the antenna. In land stations, a counterpoise forms a capacitive connection to ground.

82. COUPLER.—An apparatus which is used to transfer radio frequency energy from one circuit to another by associating portions of these circuits.

83. COUPLER, CAPACITIVE.—An apparatus which, by electric fields, joins portions of two radio frequency circuits, and which is used to transfer electrical energy between these circuits through the action of electric forces.

84. COUPLER, DIRECT.—A coupler which magnetically joins two circuits having a common conductive portion.

85. COUPLER, INDUCTIVE.—An apparatus which by magnetic forces joins portions of two radio frequency circuits.

86. COUPLING.—The connection between two circuits enabling energy to be transferred from one to the other. The connection may be by magnetic inkage, electrostatic linkage, direct connection, or any combination of these.

87. COUPLING, CO-EFFICIENT OF, in inductively coupled system is the ratio of the mutual inductance of the two circuits to the square root of the product of the self-inductance of the circuits. The coefficient of coupling (k) between two circuits tuned to the same frequency and then coupled, is also given by the formula :—

$$k = \frac{\lambda_1^2 - \lambda_2^2}{\lambda_1^2 + \lambda^2}$$

where $\lambda_1 \lambda_2$ are the longer and shorter resulting natural wavelengths of the coupled system.

88. CRITICAL RESISTANCE.—That resistance which is just sufficient to prevent free oscillation in an electrical circuit. If L inductance,

C Capacity, then Critical Resistance $= \sqrt{\frac{4L}{C}}$.

89. CRYSTAL DETECTOR.—A detector which uses the rectifying properties of the contact between a crystal and a metal surface or between two crystals.

90. CURRENT, DAMPED ALTERNATING.—An alternating current whose amplitude progressively diminishes. (Also called oscillating current.)

91. CURRENT, FORCED ALTERNATING.—A current, the frequency and damping of which are equal to the frequency and damping of the exciting electromotive force. See further, Current, Free Alternating.

NOTE I.—During the initial stages of excitation, both free and forced currents co-exist.

92. CURRENT, FREE ALTERNATING.—The current following any transient electromagnetic disturbance in a circuit having capacity, inductance, and *less* than the critical resistance. See further, Resistance, Critical.

93. CURVE, DISTRIBUTION, OF A RADIO TRANSMITTING STATION FOR A GIVEN DISTANCE.—This is a polar curve the radii vectores of which are proportional to the field intensity of the radiation at that distance in corresponding directions. See also Compass, Radio.

NOTE I.—The distribution curve depends, in general, not only on the form of the antenna, but also on the nature of the ground surrounding the station.

NOTE 2.—The distribution curve generally varies with the distance from the station.

94. CURVE, RESONANCE, STANDARD.—A curve the ordinates of which are the ratios of the square of the current at any frequency to the square of the resonant current, and the abscissas are the ratios of the corresponding wavelength to the resonant wavelength ; the abscissas and ordinates having the same scale.

95. CYCLOGRAM.—See Characteristic Dynamic.

96. CYCLOGRAPH.—An instrument for the production of cyclograms.

97. CYMOMETER.—A " wave-measurer." See Wavemeter.

98. DAMPING.—The diminution of energy in an electrical circuit resulting from loss of energy.

99. DAMPING FACTOR (of a simple circuit).—The ratio of the effective resistance of that circuit to twice the effective inductance (the reciprocal of a time). This term applies only to circuits capable of carrying free alternating currents.

100. DECREMENT.—See Decrement, Linear, and Logarithmic.

101. DECREMENT, OF A LINEARLY DAMPED ALTERNATING CURRENT.—This is the difference of successive current amplitudes in the same direction divided by the larger of these amplitudes.

NOTE.—Let I_n and I_{n+1} be successive current amplitudes in the same direction of a linearlv damped alternating current.

Then, the linear decrement, which is not a constant but varies with the amplitude,

$$b=\frac{I\ -I_{n+1}}{I_n}$$

Also: $I_t=I_o\ (1-bft)$,
where I_o = initial current amplitude,
I_t = current amplitude at time t,
f = frequency of alternating current,
$b=(I_0-I_1)\ I_0$.

102. DECREMETER.—An instrument for measuring the logarithmic decrement of a circuit or of a train of electromagnetic waves.

103. DETECTOR.—That portion of the receiving apparatus which, connected to a circuit carrying currents of radio frequency, and in conjunction with a self-contained or separate indicator, translates the radio frequency energy into a form suitable for operation of the indicator. This translation may be effected either by the conversion of the radio frequency energy, or by means of the control of local energy by the energy received.

104. DEVICE, ACOUSTIC RESONANCE.—A device which utilises in its operation resonance to the audio frequency of the received signals.

105. DIELECTRIC.—Any medium which will only allow of electric conduction to a small or negligible extent.

106. DIELECTRIC CONSTANT (or Specific Inductive Capacity) of a medium. The ratio of the capacity of a condenser having that medium as a dielectric to the capacity of a condenser having a vacuum dielectric, but otherwise identical. (The dielectric constant of air is substantially unity, and therefore for all practical purposes air may be used in place of the vacuum in the comparison condenser.)

107. DIELECTRIC HYSTERESIS.—That lagging property of a dielectric which is measured by the energy lost when the rising and falling (displacement current)—(Voltage) characteristics (dynamic) are not identical.

108. DIELECTRIC HYSTERETIC CONSTANT of a given dielectric. The value of the dielectric hysteresis per cycle per unit of potential gradient applied to the dielectric.

109. DIFFRACTION is the deviation of the direction of propagaticn of a wave from the normal to the wave front at the point where the waves pass the edge of an obstruction. The amount of diffraction depends on the wavelength and increases with increase of wavelength.

110. DIPLEX TELEGRAPHY is the simultaneous transmission or the simultaneous reception of two messages at the same station.

111. DIRECT COUPLING.—When one circuit is linked to another in such a way that a portion of the one forms part of the other they are said to be direct-coupled. An example is provided in the auto-jigger (*vide* Jigger), in which a portion of the inductance is common to two circuits.

112. DIRECTION FINDER, WIRELESS.—A receiving instrument which, in combination with a special aerial system, enables the direction of the transmitting station to be determined.

113. DISC DISCHARGER, ASYNCHRONOUS.—A disc discharger the speed of which has no fixed relation to the frequency of the current charging the condenser which it discharges.

114. DISC DISCHARGER, SYNCHRONOUS.—A disc discharger usually directly coupled to the alternator supplying power to the condenser. It may discharge the condenser, one, two, three, or more times during a half-period; or every one, two, or more half-periods. The usual practice is to discharge once every half-period, at the moment when the condenser potential is a maximum, and the alternator current zero.

115. Disruptive Voltage.—The voltage required to break down a piece of dielectric between a given pair of electrodes.

116. Discharger.—That piece of apparatus in the primary oscillating circuit at which the spark takes place.

117. Duplex Telegraphy.—Is the transmission of a message and the reception of a message simultaneously at the same station.

118. Displacement Current.—The electrical condition within a dielectric region of varying electric stress. It produces the same external electric and magnetic effects as the equivalent conduction current.

119. Dynatron.—A three-electrode thermionic tube which depends for its action on the liberation of electrons from the anode by electronic bombardment.

120. Earth Connection, or "Earth."—The connection to the earth which in most systems forms the lower extremity of the Aerial System (q.v.). It usually takes the form of a system of metal plates or wires, or a combination of both, more or less deeply buried in the ground. (U.S. equivalent, Ground.)

121. Eddy Currents.—Those induced in conducting masses by external varying magnetic fields, the location of these currents being primarily determined by the position of the fields and not by the configuration of the conducting masses. (That is, the conducting mass is not specially arranged to provide perfectly well-defined circuits.) Such parasitic currents are also called Foucault currents. They can be minimised by using stranded or laminated conductors.

122. Electric Potential is defined as the work done in carrying a unit charge of electricity from infinity to the point considered. (See Electromotive Force.)

123. Electric Stress.—The cause of the electrically strained condition in the medium between two regions which are at different potentials.

124. Electromagnetic Wave.—A progressive disturbance characterised by the existence on the wave front of electric and magnetic forces acting in directions which are perpendicular to each other and to the direction of propagation of the wave.

125. Electromotive Force.—The force which tends to displace electricity, and is equal to the difference of potential between the points considered.

126. Electron.—The natural unit of negative electricity (4.774×10^{-10} electrostatic units).

127. Endodyne Reception.—See Autodyne Reception.

128. Ether.—The medium assumed by electromagnetic theory in order to explain the translation of energy at finite speed by electromagnetic waves.

129. Excitation, Impulse.—A method of producing free alternating currents in an excited circuit in which the duration of the exciting current is short compared with the duration of the excited current.

Note.—The condition of short duration implies that there can be no appreciable reaction between the circuits.

130. Factor, Damping.—The product of the logarithmic decrement and the frequency of an exponentially damped alternating current.

Let I_o = initial amplitude,
I_t = amplitude at the time t,
ϵ = base of Napierian logarithms (2.718+)
a = damping factor.

Then, $I_t = I_o \epsilon^{-at}$.

131. Factor, Form.—The form factor of a symmetrical antenna for a given wavelength is the ratio of the algebraic average value of the R.M.S. currents measured at all heights to the greatest of these R.M.S. currents.

Note 1.—For a given R.M.S. current at the base of the antenna, the field intensity at distant points is proportional to the form factor times the height of the antenna.

NOTE 2.—The effective height (height of centre of capacity) is equal to the form factor times the actual height of the antenna.

NOTE 3.—The limiting values of the form factor for various types of antennas are as follows:

	LINEAR OR VERTICAL ANTENNA	FLAT TOP UMBRELLA ANTENNA
Long Waves	Lower Limit, 1/2	Upper Limit, 1
Fundamental	Lower Limit, $2/\pi$	———

NOTE 4.—The form factor varies in a given antenna at various wavelengths due to variation of the current distribution.

132. FILAMENT BATTERY OF THERMIONIC VALVE.—The battery by which the filament is electrically heated to incandescence.

133. FILAMENT OF THERMIONIC VALVE.—A thin conductor of meta (usually tungsten in modern valves) or carbon which when rendered incandescent emits electrons.

134. FORCED ALTERNATING CURRENT.—One produced in *any* circuit by the application of an alternating electromotive force.

135. FREE ALTERNATING CURRENT.—That produced by an isolated electrical displacement in a circuit having capacity, inductance, and less than the critical resistance.

136. FREQUENCY.—A term used in connection with any form of rhythmical motion or rhythmical change, denoting the number of complete movements or changes in a given time—usually a second.

137. FREQUENCIES, AUDIO (ABBREVIATED A.F.).—The frequencies corresponding to the normally audible vibrations. These are assumed to lie below 10,000 cycles per second.

138. FREQUENCIES, RADIO (ABBREVIATED R.F.).—The frequencies higher than those corresponding to the normally audible vibrations, which are generally taken as 10,000 cycles per second. See also Frequencies, Audio.

NOTE.—It is not implied that radiation cannot be secured at lower frequencies, and the distinction from audio frequencies is merely one of definition based on convenience.

139. FREQUENCY CHANGER.—See Changer, Frequency.

140. FREQUENCY, GROUP.—The number per second of periodic changes of amplitude or frequency of an alternating current.

NOTE 1.—Where there is more than one periodically recurrent change of amplitude, or frequency, there is more than one group frequency present.

NOTE 2.—The term "group frequency" replaces the term "spark frequency."

141. FREQUENCY METER.—An instrument which indicates frequency.

142. FREQUENCY TRANSFORMER.—See Changer, Frequency.

143. FUNDAMENTAL FREQUENCY.—The lowest frequency to which an electrical circuit will resonate.

144. FUNDAMENTAL OF AN ANTENNA.—This is the lowest frequency of free oscillations of the unloaded antenna. (No series inductance or capacity.)

145. FUNDAMENTAL WAVELENGTH.—The wavelength corresponding to the lowest free period of any oscillator.

146. GAP, MICROMETER.—A device for protecting any apparatus from excessive potentials, and consisting of a short gap designed for fine adjustment.

147. GRID OF THERMIONIC VALVE.—Is a perforated metal electrode by means of which it is possible (by suitable charging) to disturb the state of the electric field between the filament and the metal anode and so control the value of the thermionic current.

148. GRID CIRCUIT OF THERMIONIC VALVE.—The circuit which includes the space in the valve from grid to filament and the path of the external conductor from filament to grid.

149. GRID CONDENSER.—A partially insulated condenser placed in the grid circuit of a thermionic valve which, on account of the approximately unilateral conductivity of the grid circuit, produces asymmetrical variations of anode current for symmetrical applied grid voltage changes.

150. GROUND.—A conductive connection to the earth.

151. GROUP FREQUENCY.—The number of distinguishable alternating current groups occurring per second in an electrical circuit.

NOTE 1.—The group referred to above is, in general, mainly a free alternating current which is substantially damped to extinction before the beginning of the following group or train.

NOTE 2.—The pitch of the note in the receiving station is, in general, determined by the group frequency at the transmitting station.

NOTE 3.—The term "Group Frequency" replaces the term "Spark Frequency."

152. HARD VALVE.—A two or three-electrode valve of extreme exhaustion.

153. HARMONIC FREQUENCY.—The harmonics of any particular frequency are generally understood to be all higher frequencies which are odd, or even multiples of the said frequency. An electrical oscillator which has uniformly distributed inductance and capacity (a straight wire nearly fulfils these conditions) will resonate to any odd or even multiple of its fundamental frequency according to whether one end is earthed or not. If the inductance and capacity are not uniformly distributed the circuit may resonate to a number of frequencies higher than its fundamental, but these higher frequencies will not necessarily bear any whole multiple relation to the fundamental frequency.

154. HEIGHT, EFFECTIVE, OF AN ANTENNA.—See Factor, Form; Note 2.

155. HETERODYNE.—A receiver for continuous waves using the principle of reaction between locally generated oscillations and the received oscillations in order to produce beats.

156. HETERODYNE WAVEMETER.—A valve oscillator the oscillatory circuit of which is calibrated in wavelengths. Syntony between the calibrated and experimental circuits is obtained by tuning until no beats are heard.

157. HIGH-FREQUENCY RESISTANCE.—The resistance offered by a conductor to the passage of high-frequency currents.

It is always greater than the resistance for direct current because of the unequal current distribution over a section of the conductor when carrying high-frequency currents.

158. HIGH-TENSION BATTERY.—The battery used in the anode circuit of a thermionic valve.

159. HYSTERESIS.—A property of a substance or body by virtue of which an effect produced in a body by changing conditions lags behind the conditions. In the case of iron carried through a magnetic cycle, the magnetisation lags behind the magnetising force.

160. IMPEDANCE.—Total opposition to current flow in a circuit in which the current is varying, and is numerically equal to the square root of the sum of the squares of the ohmic resistance and the total reactance of the circuit.

161. IMPULSE EXCITATION.—See Excitation, Impulse.

162. INDUCTANCE, MUTUAL, between two circuits is, in the e.m. system of units, equal to the number of lines linked with one circuit due to unit current in the other (see "Inductance, Self," for explanation of "linked with"). The unit current may be supposed in either circuit, provided that it is the same at all parts of its circuit.

The mutual electrokinetic energy of two circuits carrying currents is the continued product of the currents and the mutual inductance in any consistent system of units.

INDUCTANCE, SELF, of a circuit is the electrical analogue of inertia or mass when current is taken as the analogue of velocity. In terms of magnetic

induction the inductance of a circuit in the e.m. system of units is equal to the number of lines linked with the circuit due to unit current in the circuit; "linked with" means here that a line is counted each time it threads the circuit (or each time the circuit threads it), plus being given to one sense and minus to the other

The inductance of a coil is indefinite when there is a magnetic core, because hystersis renders the flux indefinite, and is also indefinite when the current is different at different parts of the circuit, as occurs, for example, when stationary waves arise because of distributed capacity.

Co-efficient of Self Induction is often used as a synonym for Self-Inductance.

163. Inductance, Effective, of an Antenna.—See Capacity, Effective, of an Antenna.

164. Induction Coil.—A piece of apparatus which makes use of the phenomena of induction to transform an intermittent current of comparatively low voltage to an alternating current of high voltage.

165. Inductive Coupling.—Two circuits so arranged that some of the lines of force from one passing through the other circuit are inductively coupled.

166. Interference.—The interaction of two alternating currents or of electro-magnetic waves under conditions such that they oppose each other.

167. Interference (in reception).—The introduction of undesired signals, either from other stations or from Atmospherics (q.v.), into a receiver which is engaged in the reception of a message; often referred to as "jamming."

168. Interference, Wave (in Radio Communication).—The reinforcement or neutralisation of waves arriving at a receiving point along different paths from a given sending station (to be distinguished from ordinary or station interference, which is the simultaneous reception of signals from two or more stations).

169. Ionisation of a Gas.—The breaking away from the molecules of the ions contained in them, thus rendering the gas conductive.

Ionisation in gases may be brought about by various ionising agents—*e.g.*, X-rays, ultra-violet light, or high-speed electrons.

170. Ionisation by Collision.—The liberation of electrons from the atoms of a gas due to the collisions between the atoms and high-speed electrons.

171. Jamming.—See Interference (in Reception).

172. Jigger.—The transformer used in coupled circuits. The primary and secondary form part of the primary and secondary circuits respectively. If the transformer has part of the winding common to both primary and secondary, it is called an Auto-Jigger.

173. Kallirotron.—A form of aperiodic retroactive amplifier consisting of two thermionic valves so connected by pure resistances that a rise of grid potential of either produces a fall of grid potential of the other. The amplification obtained exceeds the amplification factor of either valve by any desired amount according to the extent of the retroaction.

174. Kathode.—" (*a*) In an electrolytic cell. The conductor through the surface of which the current leaves the electrolyte.

" (*b*) In a primary cell. The conductor (generally carbon) through which the current leaves the electrolyte.

" (*c*) The electrode by which the current leaves a cell or other apparatus, such as a vacuum tube or thermionic valve."

175. Key (Manipulating) (Operating).—A switch arranged for easy manual operation.

176. Key, Relay.—See Relay Key.

177. Length, Wave.—See Wavelength.

178. Line of Force.—A curve described in an electric or magnetic field such that the direction of the electric or magnetic force at any point of that curve is a tangent to the curve.

179. Loading Coil.—A coil possessing self-inductance inserted in an aerial circuit to increase the natural wavelength of the circuit.

180. Losses, Brush or Corona.—See Brush or Corona Losses.

181. Low-Tension Battery.—See Filament Battery.

182. Magnetic Field Intensity.—The number of lines of force per unit area.

183. Magnetic Force.—At a point. The force acting on a unit magnetic pole placed at that point. It is numerically equal to the field intensity in a medium of unit permeability.

184. Magnetic Hysteresis.—That property of a magnetic medium which is measured by the energy losses when the rising and falling (magneto-motive force—induction), *i.e.* (H—B), dynamic characteristics are not identical.

185. Magnetomotive Force.—A force tending to produce a magnetic flux.

186. Magnetic Detector (Marconi's).—A detector of oscillations depending on the effect on the hysteresis of iron.

187. Microphone.—A variable resistance, usually in the form of an electrical contact, whose resistance is varied with and in a proportional manner to the movement or pressure of one part. Thus if the movement or pressure is produced by sound waves acting on a diaphragm which is connected to the moving member of the microphone, an electrical current will be produced in the circuit containing the microphone and a battery, whose amplitude varies in a similar manner to the movement of the diaphragm.

188. Mutual Conductance of a thermionic valve is given by the slope of the grid voltage—anode current characteristic at any operating point.

189. Mutual Inductance.—See Inductance, Mutual.

190. Natural Frequency.—Is the frequency with which a circuit will oscillate when supplied with energy and then left to itself.

191. Natural Frequency of Antenna.—See Capacity, Effective, of an Antenna.

192. Note or Tone Tuning.—A receiver is tuned to the note of the transmitter when a circuit or part of the indicator is designed to resonate to the spark frequency.

193. Oscillating Valve.—A thermionic valve in a circuit which is electrically unstable and generating continuous oscillations.

194. Oscillations.—See Alternating Currents, Free and Forced, also Current, Damped Alternating.

195. Oscillator, Arc.—See Arc Oscillator.

196. Oscillograph.—" An apparatus for observing or recording quickly varying currents or potential differences " (B.E.C.).

197. Period, Periodic Time.—" Any varying quantity which repeats its values regularly at equal time intervals is said to be periodic, and the time-interval of one repetition is called the periodic time or period " (B.E.C.).

198 Permeability of a medium.—The ratio of the magnetic flux density produced in that medium by a given magnetomotive force to the magnetic flux density produced by the same magnetomotive force in vacuum (or, for practical purposes, in air).

199. Phase.—" (*a*) In an operation which recurs periodically the stage or state to which the operation has proceeded.

" (*b*) In an operation which recurs periodically the fraction of the whole period which has elapsed, measured from some fixed origin " (B.E.C.).

200. PHASE DIFFERENCE.—" The difference of phase (usually reckoned in time or in angle) between two periodic quantities which vary harmonically. Each of the circuits of a polyphase apparatus is sometimes called a phase" (B.E.C.).

201. PLAIN AERIAL.—An early form of transmitter in which the spark gap was placed directly in series with aerial and earth, so that the only condenser in which the energy of the transmitter could be stored was the capacity of the aerial to earth.

The term is also applied to the receiving circuit when the detector is placed directly in series with the receiving aerial and earth.

202. PLATE.—See Anode.

203. PLATE CIRCUIT.—Is the circuit in a thermionic valve which includes the space in the valve from plate to filament and the path through the external conductors from filament to plate.

204. PLIODYNATRON.—A combination of a pliotron and a dynatron, being a four-electrode thermionic tube. The output is controlled by the control grid which is between the filament and the heavier grid-anode.

205. PLIOTRON.—A three-electrode valve of extreme exhaustion.

206. POLARISATION of a wave.—A wave is said to be plane polarised when its electric and magnetic displacements are confined to two fixed planes at right angles.

When the plane of the electric and magnetic displacement rotates uniformly with time, the waves are said to be circularly or eliptically polarised.

Such waves result from the compounding of two plane polarised waves having the same frequency and line of propagation but different relative phases and polarised in different planes.

207. POTENTIOMETER.—An instrument for adjusting at will the potential between any two parts of a circuit.

An instrument for measuring potential difference.

208. POTENTIAL.—See Electrical Potential.

209. POWER.—The amount of work done in unit time.

210. POWER, APPARENT.—In an alternating electric circuit this is the product volts × amperes.

211. POWER FACTOR.—" The ratio of the watts to the voltampères. In the case of voltage and current of sine form the power factor is cos φ " (B.E.C.). In an oscillating circuit $\cos \varphi = \frac{\delta}{\pi}$ where δ is the decrement.

212. QUENCHED SPARK.—A spark whose duration is shortened by conditions at the discharger designed to increase rapidly the resistance at the spark gap is said to be " quenched."

213. RADIATION RESISTANCE.—The resistance which multiplied by the square of the R.M.S. current in the aerial equals the energy lost by the aerial in radiation.

214. RADIATION, SUSTAINED.—See Waves, Sustained.

215. RADIOGRAM.—A telegram sent by radio.

216. TO RADIOGRAPH (VERB).—To send a radiogram.

217. RADIOTELEPHONE.—An apparatus for the transmission of speech by radio.

218. RADIO PHONE (NOUN).—A telephone message sent by radio.

219. TO RADIOPHONE (VERB).—To send a radiophone.

220. REACTANCE of a circuit is a function of the inductance, capacity, and the impressed frequency.

An inductance has reactance $2 \pi \times$ frequency $\times$ inductance.

A capacity has reactance

$$\frac{1}{2\pi \times \text{frequency} \times \text{capacity}}$$

An inductance in series with a capacity has reactance equal to the sum of the reactance of the inductance and the reactance of the condenser.

Under conditions of resonance in a circuit the reactance of the capacity neutralises the reactance of the inductance and the resulting reactance is zero.

221. Rectifier.—An apparatus for converting alternating or oscillating currents into continuous current, or into pulses of unidirectional current. Rectifier, Electron.—A device for rectifying an alternating current by utilising the approximately unilateral conductivity between a hot cathode and a relatively cold anode in so high a vacuum that a pure electron current flows between the electrodes. See also Kenetron.

222. Rectifier, Gas.—An electron rectifier containing gas which modifies the internal action by the retardation of the electrons or the ionisation of the gas atoms.

223. Reflection of Electromagnetic Waves.—(1) When a wave reaches the interface between two media of different dielectric constants its energy does not wholly pass from one medium to the other, but in part remains in the first medium in a reflected wave which travels back from the interface. When the dimensions of the separating surface are large compared with the wavelength the laws of reflection of electromagnetic waves are in general the same as for light.

(2) When waves are being guided by a conductor, such as a wire which has a certain inductance and capacity per unit length, any abrupt change in the value of these constants (such as are produced by inserting an inductance coil, or occur at the end of the wire) causes the production of alternating potentials which result in a wave which travels along the wire in the opposite direction. This second wave is also called a reflected wave.

224. Refraction.—The change in the direction of a wave propagation when passing from one medium to another.

225. Regenerative or Retroactive Amplification.—Amplification obtained in a thermionic valve by causing the energy variations of the anode circuit to feed back into the grid circuit and thus increase the voltage operating on the grid.

226. Relay.—An apparatus by means of which a current, too small to perform a required work, is made to control a larger and adequate current.

227. Relay, Electron.—A device provided with means for modifying the pure electron current flowing between a hot cathode and a relatively cold anode placed in as nearly as possible a perfect vacuum.

These means may be, for example, an electric control of the pure electron current by variation of the potential of a grid interposed between the cathode and the anode.

228. Relay, Gas.—An electron relay containing gas which modifies the internal action by the retardation of the electrons or the ionisation of the gas atoms.

229. Relay Key.—An electrically operated key. See further, Key.

230. Resistance.—The measure of that property of a conductor by the action of which electrical energy is transformed into heat in that conductor. It is numerically equal to the ratio of the heat energy liberated per second, measured in watts, to the square of the current in the circuit, for stationary conditions; it is also equal to the ratio of the applied electromotive force to the resulting current, both being constant.

231. Resistance, Antenna.—See Antenna Resistance.

232. Resistance, Critical, of a Circuit.—That resistance which determines the limiting condition at which the oscillatory discharge of a circuit passes into an aperiodic discharge.

233. Resistance, Effective, of a Spark.—The ratio of the power dissipated by the spark to the mean square current.

234. Resistance, Radiation.—This is the ratio of the total energy radiated (per second) by the antenna to the square of the R.M.S. current at a potential node (generally the ground connection). See further, Antenna, Resistance.

235. Resistance, Radio Frequency.—This is the ratio of the heat produced per second in watts to the square of the R.M.S. current (R.F.) in amperes in a conductor.

236. Resonance.—Resonance of a circuit to a given exciting alternating E.M.F. is that condition due to variation of the inductance or capacity in which the resulting effective current (or voltage) in that circuit is a maximum.

Note 1.—Instead of varying the inductance and capacity of a circuit the frequency of the exciting field may be varied. The condition of resonance is determined by the frequency at which the current (or voltage) is a maximum.

Note 2.—The resonance frequency corresponds the more accurately to the frequency of the free oscillations of a circuit, the lower the damping of the exciting alternating field and of the excited circuit.

A circuit will resonate to an impressed frequency when the reciprocal of 2π times the square root of the product of inductance and capacity is equal to the impressed frequency and provided that its resistance is less than the critical resistance. Under conditions of resonance the amplitudes of successive half-periods of the resultant current gradually increase to a maximum which is dependent only on the impressed electromotive force and the resistance of the circuit, including radiation.

237. Resonance, Acoustic Device.—See Device, Acoustic Resonance.

238. Resonance Curve.—A curve showing the relation between the current or voltage induced in an oscillatory circuit and the inducing frequency.

239. Resonance, Sharpness of.—See Tuning, Sharpness of.

240. Retroactive Amplification.—See Regenerative Amplification.

241. Root-Mean-Square Value.—R.M.S. value of an alternating or oscillating current or voltage is the value given by the square root of the mean of the squares of the successive values throughout the half-period.

In a current or voltage of strict sine-wave form (sinusoidal) the R.M.S. value is equal to the maximum multiplied by ·707—*i.e.*, $(1/\sqrt{2})$. The R.M.S. value is also called the effective or virtual value.

242. Selectivity.—The power of a receiving system to discriminate between a number of simultaneous signals.

243. Self-Inductance of a circuit.—See Inductance, Self.

244. Sharpness of Tuning.—The measure of the rate of diminution of current in transmitters and receivers with detuning of the circuit which is varied.

If d_2 is the decrement of the free alternating current in the circuit and d_1 the decrement of the exciting E.M.F., then the sharpness of tuning is arbitrarily defined as $\frac{\pi}{d_1 + d_2}$.

In the case of continuous oscillations this reduces to $\frac{\pi}{d_2}$.

245. Sheath.—The anode or plate of a thermionic valve.

246. Shock Excitation.—A name given to the method of exciting oscillations in the aerial circuit by a sudden and very short transference of energy from another circuit.

247. Shortening Condenser.—A condenser inserted in series with an aerial circuit to decrease the natural wavelength of the circuit.

248. SKIN EFFECT OF VARYING CURRENTS.—The non-uniform current density through the cross-section of the conductor. It is greatest at the surface and least at the centre.

249. SOFT VALVE.—A two or three-electrode valve containing an appreciable amount of gas.

250. SPACE CHARGE.—The electric charge possessed by the electrons or positive ions situated in the vacuous space between the electrodes of a discharge tube or thermionic valve.

251. SPARK.—An electrical discharge across a gap. It may consist of one discharge in either direction, but generally consists of a number of rapid oscillatory discharges.

252. SPECIFIC INDUCTIVE CAPACITY.—See Dielectric Constant.

253. STATIC.—Disturbances caused by atmospheric charging of the antenna.

NOTE.—When it is definitely known that disturbances are due to atmospheric charging of the antenna, the word "Static" is used. In general, disturbances are called "Strays."

254. STRAYS.—Electromagnetic disturbances set up by distant charges.

255. SYNTONY AND SYNTONISATION.—The adjustment of one circuit to another, or of one transmitter taken as a whole to one receiver taken as a whole, in such a way that their time-periods are the same and waves of a different time-period produce little or no effect on the system.

256. TELEGRAPHY, RADIO.—The art of sending and receiving radiograms.

257. TELEPHONY, RADIO.—The art of sending and receiving radiophones.

258. THERMIONIC CURRENT.—The current passing through a vacuous space and consisting of electrons or ions emitted by an incandescent electrode.

259. THERMIONIC VALVE.—A vacuum tube with incandescent filament and auxiliary electrodes which may function as an amplifier, detector or generator of electrical oscillations.

260. TICKER, TIKKER.—A rapid make-and-break device used in conjunction with a resonant circuit and a pair of telephones as a receiver for continuous waves. It discharges the condenser of the resonant circuit at every make. The speed of the make-and-break device has no relation to the wave frequency.

261. TONE WHEEL.—A high-speed commutator used as a receiver for continuous waves. It is run at a speed slightly different from the synchronous speed for the wave frequency and in effect converts the high-frequency current into a current of audible frequency.

262. TRAIN OF WAVES.—The waves produced by one discharge of the primary condenser in a spark circuit.

263. TRANSFORMER.—A stationary induction apparatus for transferring energy from one circuit to another by the medium of magnetic energy.
It may or may not transform the current into another current at different potential. In present radio practice the term should be restricted to audio frequency transformers. See Frequency, Audio.

264. TRANSMISSION, DIPLEX.—See Diplex Transmission.

265. TUNER.—An apparatus made in a convenient form, which in conjunction with a detector provides all necessary circuits and adjustments for selective tuning.

266. TUNING.—The process of securing the maximum indication by adjusting the time period of a driven element. See Resonance.

267. TUNING, SHARPNESS OF.—See Sharpness of Tuning.

268. UNDAMPED WAVES.—See Continuous Waves.

269. VACUUM TUBE, THREE ELECTRODE.—As examples see Relays, Electron and Gas.

270. VACUUM TUBE, TWO ELECTRODE.—As examples see Rectifiers, Electron and Gas.

271. VALVE, FLEMING.—A detector for oscillations. It depends on the rectifying properties of the ionised space between a hot filament and a cold electrode in an exhausted vessel.

272. VALVE, THERMIONIC.—See Thermionic Valve.

273. WAVES, ELECTROMAGNETIC.—A periodic electromagnetic disturbance progressive through space.

274. WAVELENGTH.—Twice the distance (taken in the line of propagation of the wave) between two successive points of zero disturbance; or the distance between two consecutive maxima, of the same sign. The wavelength is numerically equal to the velocity of the waves divided by the frequency.

275. WAVELENGTH (OF AN ELECTROMAGNETIC WAVE).—The distance in metres between two consecutive maxima of the same sign. The wavelength is numerically equal to the velocity of the waves (3×10^{10} cms. per second) divided by their frequency.

276. WAVELENGTH, FUNDAMENTAL.—See Fundamental Wavelength.

277. WAVELENGTH, NATURAL.—In a loaded antenna (that is, with series inductance or capacity) the natural wavelength corresponds to the slowest free oscillation.

278. WAVE CHANGER.—See Changer, Wave.

279. WAVEMETER.—A radio frequency measuring instrument calibrated to read wavelengths.

280. WAVES SUSTAINED.—Waves radiated from a conductor in which an alternating current flows.

281. WAVE TRAIN.—See Train of Waves.

282. WING CIRCUIT.—See Anode Circuit.

(ii) FOREIGN EQUIVALENTS.

English.	French.	Italian.	Spanish.	German.
Accumulator batteries	Batterie d'accumulateurs	Batterie di accumulatori	Acumuladores, Bateriasde	Accumulatoren Batterie
Aerial, balancing	Antenne de compensation	Antenna di compensazione	Antena compensadora	Wage Antenne
Aerial, directional	Antenne dirigée	Antenna dirigibile	Antena dirigida	Gerichtete Antenne
Aerial, direction finder	Antenne réception dirigée	Antenna, rivelatrice della direzione	Antena para busca de direcciones	Antenne, zur Entdeckung der Richtung
Aerial, horizontal	Antenne horizontale	Antenna orizzontale	Antena horizontal	Horizontaler Luftleiter
Aerial, receiving	Antenne de réception	Antenna di ricezione	Antena de recepcion	Empfangsdraht
Aerial, transmitting	Antenne d'émission	Antenna di trasmissione	Antena de transmission	Geberdraht (Sendeluftleiter)
Aerial, umbrella	Antenne en parapluie	Antenna a forma di ombrella	Antena de paragua en forma	Schirmnetz
Alternator	Alternateur	Alternatore	Alternador	Wechselstrom Generator
Alternator, high-frequency	Alternateur à haute fréquence	Alternatore ad alta frequenza	Alternador de Alta frecuencia	Hochfrequenz Generator
Ammeter, a.c.	Ampèremètre pour courant alternatif	Amperometro per corrente alternata	Amperímetro, c a	Wechse stromamperemeter
Ammeter, d.c.	Ampèremètre pour courant continu	Amperometro por corrente continua	Amperímetro, c c	Gleichstromamperemeter
Ammeter, hot-wire	Ampèremètre à fil chaud	Amperometro a filo caldo	Amperímetro térmico	Hitzdrahtamperemeter
Ammeter, moving coil	Ampèremètre d'Arsonval	Amperometro a bobina mobile	Amperímetro de bobina movil	D'Arsonvalscher Amperemeter
Amplifier, thermionic	Amplificateur à lampes	—	—	Vakuum-röhren Verstärker
Angle divider	Diviseur d'angle	Divisore di angoli	Divisor de Angulo	Winkel Trennungs-Apparat
Anode	Anode	Anodica	—	Anod
Antenna	Antenne	Antenna	Antena	Luftleiter (Antenne)
Antenna, horizontal extension of	Branche horizontale de l'antenne	Fili orizzontali dell' antenna	Antena, Prolongación horizontal de la	Horizontale Verlangerungsdrahte des Luftleiters
Antenna, T-shaped	Antenne en T	Antenna a forma di T	Antena en forma de T	T formige Antenne
Antenna, extended T-shaped	Antenne en T à branches horizontales prolongées	Antenna a forma di T. allungata	Antena en forma de T prolongada	Verlängerte T Luftleiter
Apparatus, receiving	Appareils de réception	Apparecchi di ricezione	Aparatos receptores	Empfanger
Apparatus, transmitting	Appareils de transmission	Apparecchi di trasmissione	Aparatos transmisores	Sender
Arrester, earth terminal	Eclateur de mise à terre	Morsetto per presa di terra	Espacio de chispa de tierra	Unterbrochener Erdanschlusz
Arrester, lightning	Parafoudre	Dispositivo scaricafulmine	Pararrayos	Blitzschutz
Atmospherics	Perturbations atmosphériques	Perturbazioni atmosferiche	Perturbaciones Atmosféricas	Luftstoerungen
Audio frequency	Basse fréquence	Frequenza acustica	Frecuencia acústica	Ton frequenz

				wandler
Battery of Leyden jars	Batterie de bouteilles de Leyde	Batteria di bottiglie di Leida	Bateria de Botellas de Leyden	Batterie Leydener Flaschen
Beats (Heterodyne)	Sons de battements	—	—	—
Bell, call-	Sonnerie d'appel	Campanello di chiamata	Timbre de Llamada	Lockklingel
Blower, electric motor	Soufflerie à moteur électrique	Ventilatore ad azionamento elettrico	Motor soplador or Ventilador eléctrico	Geblaese mit Elektrischen Antrieb
Busbars, main-	Barres omnibus principales	Barre collettrici principali	Barras colectoras principales	Haupt Sammelschienen
Building, station-	Bâtiment du poste radiotélégraphique	Fabbricato della stazione	Edificio de la estación	Stationhaus
Buzzer	Vibrateur	Vibratore	Zumbador	Summer
Buzzer, practice	Vibrateur d'apprentissage	Cicala per la pratica della ricezione a udito	Zumbador para prácti	Ubungssummer
Capacity	Capacité	Capacità	Capacidad	Aufnahmefähigkeit
Capacity earth	Contrepoids	Capacità di terra	Capacidad de tierra	Gegengewicht
Cart, radiotelegraph	Voiture radiotélégraphique	Carro radiotelegrafico	Carro de radiotelegrafía	Funkenkarren
Cathode, incandescent	Cathode incandescente	Catodo incandescente	Cátodo incandescente	Glühende Kathode
Change of connections for receiving	Commutation pour la réception	Commutazione per ricezione	Cambio de conexiones para la recepción	Umschaltung auf Empfangen
Change of connections for transmitting	Commutation pour la transmission	Commutazione per trasmissione	Cambio de conexiones para la transmisión	Umschaltung auf Senden
Chokes, air core protecting	Bobine de réactance sans noyau de fer	Bobine di protezione a nucleo d'aria	Bobinas de reactancia, protectoras, de núcleo de aire	Impedanzspulen fur hohe Frequenz mit Luftkern
Choking coil	Bobine d'impédance	Roccehtto d'autoinduzione	Bobina de reactancia	Drosselspule
Circuit breaker and closer	Disjoncteur et conjoncteur automatique	Interruttore	Interruptor con apertura y cierre automáticos	Strom - unterbrecher und Strom-schliesser
Circuit, closed oscillating	Circuit oscillant fermé	Circuito oscillante chiuso	Circuito oscilante cerrado	Geschlossener Erregerkreis
Circuit, intermediate	Circuit intermédiaire	Circuito intermedio	Circuito intermedio	Zwischenkreis
Circuit, open radiating	Circuit radiant ouvert	Circuito radiante aperto	Circuito radiador abierto	Offener Strahlungskreis
Circuit, oscillatory	Circuit oscillatoire	Circuito oscillante.	Circuito oscilante	Schwingungskreis
Coherer	Cohereur	Ricevitore a coherer	Cohesor	Fritterempfänger
Coil, syntonising	Inductance de syntonisation	Rocchetto di sintonizzazione	Bobina de sintonización	Abstimmspule
Commutator	Commutateur	Commutatore	Commutador	Stromwender
Commutator (of Dynamo)	Collecteur	Collettore	Colector	Stromwender
Condensers	Condensateurs	Condensatori	Condensadores	Kondensatoren
Condenser, adjustable	Condensateur règlable	Condensatore regolabile	Condensador variable	Variabler Kondensator
Condenser, adjustable disc	Condensateur à disque	Condensatore a disco regolabile	Condensador de disco, variable	Drehkondensator
Condenser, aerial tuning	Condensateur de syntonisation d'antenne	Condensatore per la sintonizzazione dell' antenna	Condensador de sintonización de la antena	Kondensator zur Luft leiterabstimmung

English.	French.	Italian.	Spanish.	German.
Condenser, air	Condensateur á air	Condensatore ad aria	Condensador de dialéctrico de aire	Luftkondensator
Condenser, calibration	Condensateur étalon	Condensatore per tarature	Condensador para calibración	Eichungskondensator
Condenser, circuit	Circuit du condensateur ;	Circuito del condensatore	Condensador, Circuito de	Kondensatorkreis
Condenser, intermediate circuit	Condensateur du circuit intermèdiaire	Condensatore per il circuito intermedio	Condensador del circuito intermedio	Kondensator im Zwischen kreis
Condenser, secondary circuit	Condensateur du circuit secondaire	Condensatore per il circuito secondario	Condensador del circuito secundario	Kondensator im Secundärkreis
Condenser, short wave	Condensateur de raccourcissement	Condensatore per onda corta	Condensador de onda corta	Verkürzungskondensator
Condenser-system	Système de condensateur	Sistema di condensatori	Sistema de Condensadores	Kondensatorsystem
Condensers, test-tube	Condensateurs â tube	Condensatori tubolari	Tubo para ensayo de condensadores	Kondensator Prüfröhre
Condenser, twin-coupled	Condensateur jumelé	Condensatore a doppio accoppiamento	Condensador de doble acoplamiento	Kondensator, doppelt geschaltete
Condensers, variable	Condensateurs règlables	Condensatori variabili	Condensadores variables	Variablerkondensatoren
Converter	Commutatrice	Convertitore	Convertidor	Drehumformer
Continuous wave	Onde entretenue	Onda continua	Onda continua	Kontinuierlische Welle
Continuous wave receiver	Recepteur pour ondes entretenues	Ricevitore d'onde non smorzate	Receptor para onda continua	Empfanger fuer kontinuierlische Welle
Coupling	Couplage	Accoppiamento	Acoplamiento	Kopplung
Couplings, flexible and insulating	Manchons d'accouplement souples et isolants	Accoppiamenti elastici ed isolanti	Acoplamientos flexibles y aisladores	Biegsame und isolierende Verbindungen
Current, alternating	Courant alternatif	Corrente alternata	Corriente alterna	Wechselstrom
Current, direct	Courant continu	Corrente continua	Corriente contínua	Gleichstrom
Current, primary alternating	Courant alternatif primaire	Corrente alternata del circuito primario	Corriente alterna primaria	Primär Wechselstrom
Cut-out, automatic	Interrupteur automatique	Interruttore automatico	Interruptor automático	Selbstunterbrecher
Cymometers	Cymomètres	Cimometri	Cimómetro	Wellenmesser
Damper	Sourdine	Sordina	Amortiguador	Dämpfer
Damping, high	Amortissement élevé	Forte smorzamento	Amortiguamiento, Gran	Grosse Dämpfung
Decremeter	Décrémètre	Decrimetro	Decrêmetro	Dekremeter (Dampfungsmesser)
Detector, crystal	Détecteur à cristal	Rivelatore di onde a cristallo	Detector de cristal	Krystalldetektor
Detector, balanced crystal	Détecteur à cristal équilibré	Rivelatore a cristalli compensati	Detector de cristal compensador	Wellenanzeiger, bilanzierten Kristall

	ration Fleming	Valvola di Fleming	Fleming	Empfänger
Detector, magnetic	Détecteur magnétique	Rivelatore di onde magnetico	Detector magnético	Marconi-Magnetdetektor
Detector, thermo-electric	Détecteur thermo-électrique	Rivelatore di onde termo-elettrico	Detector termoeléctrico	Thermo-elektrischer-detektor
Dielectric strength	Rigidité diélectrique	Rigidità dielettrica	Resistencia dieléctrica	Dielektrische Festigkeit
Discharger, asynchronous	Eclateur asynchrone	Scaricatore asincrono	Descargador asincrono	Scheibenfunkenstrecke, asynchron
Discharger, disc, high-speed	Eclateur à disque à grande-vitesse	Scaricatore a disco ad alta velocitá	Descargador de disco de gran velocidad	Schnell rotierende Scheibenfunkenstrecke
Discharger, disc, smooth	Eclateur à disque uni	Scaricatore a disco a contorni lisci	Descargador de discoliso	Rotierende Scheibenfunkenstrecke-glatt
Discharger, disc, studded	Eclateur à disque—muni de prisonniers latéraux	Scaricatore a disco con punte	Descargador de disco dentado	Rotierende Scheibenfunkenstrecke mit Zähne
Discharger, fixed	Eclateur fixe	Scaricatore fisso	Descargado fijo	Scheibenfunkenstrecke, fixierter
Discharger, micrometric spark	Eclateur à étincelle micromètrique	Scaricatore per la produzione di scintilla micrometrica	Descargador de chispa micrométrica	Mikrometerfunkenstrecke
Discharger, side electrodes	Eclateur à électrodes latérales	Scaricatore con elettrodi laterali	Descargador, electrodos laterales del	Scheibenfunkenstrecke, Seiten electroden
Discharger, synchronous	Eclateur synchrone	Scaricatore sincrono	Descargador sincrono	Scheibenfunkenstrecke, synchron
Duplex telegraphy	Télégraphe duplex	Telegrafia duplex	Telegrafía duplex	Duplex Telegraphie
Earth connection	Connexion de terre	Messa a terra	Conexión de tierra	Erd Verbindung
Efficiency	Rendement	Rendimento	Rendimiento	Wirkungsgrad
Electromagnetic coupling	Couplage électro-magnétique	Accoppiamento elettro-magnetico	Acoplamiento electro-magnético	Electromagnetische Kopplung
Electron emission	Emission d'électrodes	Emissione elettronica	Emisión de electrones	Electronenemission
Electrostatic coupling	Couplage électro-statique	Accoppiamento elettro-statico	Acoplamiento electro-stático	Electrostatische Kopplung
Filament battery	Batterie des filaments	Batteria d'accensione dei filamenti	Batería de filamento	Heizbatterie
Frequency, high	Haute fréquence	Alta frequenza	Frecuencía, alta	Hochfrequenz
Frequency, low	Basse fréquence	Bassa frequenza	Frecuencia, baja	Niedfrequenz
Frequency meter	Fréquencemètre	Frequenziometro	Frecuencímetro	Frequenzmesser
Generating plant	Générateur	Impianto generatore	Instalación generadora	Stromanlage
Generator, c.c.	Dynamo	Generatore di corrente continua	Generador de corriente contínua	Dynamo (Gleichstrom)
Grid	Grille	Griglia	Rejilla	Gitter

English.	French.	Italian.	Spanish.	German.
Grid circuit	Circuit de grille	Circuito di griglia	Circuito de rejilla	Gitter Kreis
Grid leak	Shunt de grille	Circuito di dispersione di griglia	Derivación de rejilla	Gitter Ableitung
Group frequency	Fréquence des trains d'ondes	Frequenza delle scintille	Frecuencia de tren	Gruppen frequenz
Hammer-break, magnetic	Interrupteur à marteau	Interruttore magnetico a martello	Interruptor magnético de martillo	Magnetischer Hammerunterbrecher
Heterodyne	Hétérodyne	—	—	Heterodyn
Heterodyne receiver	Hétérodyne	Ricevitore a eterodina	Receptor heterodino	Überlagerungs Empfänger
Impedance	Impédance	Impedenza	Impedancia	Scheinbarer Widerstand
Inductance, aerial	Inductance d'antenne	Induttanza dell' antenna	Inductancia de antena	Antenneninduktanz
Inductance, aerial tuning	Inductance à syntoniser le circuit de l'antenne	Induttanza per la sintonizzazione dell' antenna	Inductancia de sintonización de la antena	Induktanz zum Syntonisieren der Antenne
Inductance, low frequency	Bobine d'inductance du circuit à basse fréquence	Induttanza per il circuito a bassa frequenza	Inductancia del circuito de baja frequencia	Induktanzspule niedriger Frequenz
Inductance, primary	Inductance primaire	Induttanza per circuito primario	Inductancia primaria	Primärinduktanz
Inductance, primary syntonising	Inductance primaire de syntonisation	Induttanza sintonizzatrice del circuito primario	Inductancia primaria de sintonización	Primärinduktanz zum Abstimmen
Inductance, variable primary syntonising	Inductance primaire variable de syntonisation	Induttanza sintonizzatrice del circuito primario, regolabile	Inductancia variable de sintonización del primario	Veränderliche Primärinduktance zum Abstimmen
Induction coil	Bobine d'Induction	Rocchetto d'induzione	Bobina de inducción	Rhumkorffscher Funkeninduktor
Inkwriter, Morse	Appareil Morse enregistreur	Ricevitore scrivente Morse	Aparato Morse registrador	Schreibempfänger
Insulation	Isolation	Isolamento	Aislamiento	Isolierung
Insulation resistance	Résistance d'isolament	Resistenza d'isolamento	Resistencia de aislamiento	Isolation Widerstand
Insulator, leading-in	Isolateur d'entrée	Isolatore d'entrata	Aislador de entrada	Isolator, Einfuehrungs
Insulator, flexible	Isolateur souple	Isolatore elastico	Aislador flexible	Flexibler Isolator
Insulator, receiving	Isolateur de réception	Isolatore dell' antenna di ricezione	Aislador para circuito receptor	Isolator fur den Empfangsdraht
Insulator, transmitting	Isolateur de transmission	Isolatore dell' antenna di transmissione	Aislador para circuito transmisor	Isolator fur die Senderantenne
Interrupter	Rupteur	Interruttore	Interruptor	Unterbrecher

		Interruttore di corrente	Interruptor de corriente	Stromunterbrecher
Interrupter, electrolytic	Rupteur électrolytique	Interruttore elettrolitico	Interruptor electrolítico	Wehnelt Unterbrecher
Interrupter, turbine	Turbo-rupteur à mercure	Interruttore a turbina	Interruptor de turbina	Quecksilberturbinen-unterbrecher
Jigger	Transformateur d'oscillations	Trasformatore delle correnti oscillatorie	"Jigger"	Jigger, Selbst-induktion des Erregerkreises
Jigger, balanced	Jigger compensé	Trasformatore ad alta frequenza compensato	Jigger compensador	Jigger, bilanzierter
Jigger, primary	Primaire de transformateur d'oscillation	Circuito primario del transformatore delle correnti oscillatorie	"Jigger," primario del	Primär-Jigger
Jigger, secondary	Secondaire de transformateur d'oscillation	Circuito secondario del trasformatore delle correnti oscillatorie	"Jigger," secundario del	Sekundär-Jigger
Key-sending	Manipulateur	Tasto manipolatore di trasmissione	Manipulador	Taste
Lamp, tuning—and choke	Lampe de Syntonisation avec bobine de réactance	Lampada di sintonizzazione con bobina	Lámpara de sintonización y de reactancia	Syntonisierlampe mit Impedanz
Leyden jar	Bouteille de Leyde.	Bottiglia di Leida.	Botella de Leyden	Leydener Flasche
Leyden jar, battery of	Batterie de bouteilles de Leyde	Batteria di bottiglie di Leida	Botellas de Leyden, Bateria de	Batterie Leydener Flaschen
Lightning arrester. (*See* Arrester, lightning)				
Loading coil	Self de syntonisation	Induttanza d'aereo	Inductancia adicional	Verlängerung Spule
Magnetic amplifier	Amplificateur à transformateurs	Amplificatore magnetico	Amplificador magnético	Magnetische Verstärker
Mast, portable	Mât, portatif	Albero, portatile	Mástil, portátil	Tragbarer Mast
Masts, steel sectional	Mâts d'acier à sections	Albero di acciaio diviso in sezioni	Mástil de secciones de acero	Stahlmasten in Teilen
Mast, telescopic	Mât, téléscopique	Albero telescopico	Mástil telescópico	Teleskopmast
Microphone	Microphone	Microphono	—	Microphon
Microphone apparatus	Appareil microphone	Apparecchio microfonico	Aparato microfónico	Microphon-Apparat
Micrometer, spark	Micromètre à étincelle	Micrometro per Scintilla	Micrometro de chispa	Funkenmikrometer
Motor alternator disc set	Groupe moteur alternateur avec éclateur à disque	Gruppo convertitore con scaricatore a disco	Grupo de motor, alternador con estallador de disco	Wechselstromgenerator kombiniert mit Rotierende Funkenstrecke
Multiple antenna	Antenne multiple	Antenna multipla	Antena múltiple	Mehrfache Antenne
Multiple transmission and reception	Transmission et réception multiples	Trasmissionec Ricezione multipla	Transmisión y recepción múltiple	Vielfach Ubermittlung und Empfang
Oscillations, electric.	Oscillations électriques	Oscillazioni elettriche	Oscilaciones eléctricas	Elektrische-Schwingungen
Oscillating valve	Oscillateur à lampes	—	—	Röhrensender

English.	French.	Italian.	Spanish.	German.
Oscillatory circuit	Circuit oscillant	Circuito oscillante	Circuito oscilante	Schwingungs Kreis
Overload	Surcharge	Sovraccarica	Sobrecarga	Überlast
Plant, radiotelegraphic	Installation radiotélégraphique	Impianto radiotelegrafico	Instalación radiotelegráfica	Radiotelegraphische Anlage
Plate	Plaque, Anode	Anodica	—	Anod, Platte
Plate circuit	Circuit de plaque	Circuito di piastra	Circuito de placa	Anoden Kreis
Potentiometer	Potentiomètre	Potenziometro	Potenciómetro	Potentiometer
Radiating antenna	Antenne transmettrice	Antenna irradiante	Antena radiadora	Strahlende Antenne
Radio frequency	Haute fréquence	Frequenza radiotelegrafica	Frecuencia radio	Radio frequenz
Radiogoniometer	Radiogoniomètre	Radiogoniometro	Radiogonometro	Radiogoniometer
Range	Portée	Portata	Alcance	Reichweite
Reactance	Réactance	Reattanza	Reactancia	Inductive Widerstand
Reaction coupling	Couplage des réactions	Accoppiamento di reazione	Acoplamiento de reacción	Rück Kopplung
Receiver	Appareil récepteur	Apparecchio ricevitore	Receptor	Empfänger
Receiver arrangement	Dispositif de réception	Dispositivo di ricezione	Dispositivo de recepcion	Empfangsvorrichtung
Receiver, balanced	Récepteur compensé	Rivelatore compensato	Receptor compensador	Empfanger, bilanzierter
Receiver, flexible	Récepteur souple	Ricevitore flessibile	Receptor flexible	Empfänger
Receiver, vacuum valve	Récepteur à valve d'oscillation	Ricevitore con valvola a vuoto	Receptor de válvula de vacio	Vakuum ventil Empfänger
Rectifiers	Rectificateurs	Raddrizzatori di corrente	Rectificador	Ausgleicher
Relay	Relais	Soccorritore	Relevador	Relais
Relay H.T.	Relais pour haute tension	Soccorritore ad alta tensione	Relevador A.T.	Hochspannungrelais
Relay magnets	Aimants du relais	Magneti di soccorritore	Imanes del relevador	Relais-magnete
Resistance, high	Haute résistance	Alta resistenza	Resistencia, alta	Hoher Widerstand
Resistance, low	Basse résistance	Bassa resistenza	Resistencia, baja	Niedriger Widerstand
Resistance, starting	Rhéostat de démarrage	Reostato di avviamento	Reostato de arranque	Anlasser
Resistance regulating	Rhéostat de champ	Reostato di campo.	Resistencia de regulación	Regulierwiderstand
Room, accumulator (battery)	Salle des accumulateurs	Stanza per la batteria di accumulatori	Sala de acumuladores (Bateria)	Akkumulatorenraum
Room, operating	Salle de manipulation et réception	Ufficio radiotelegrafico	Sala telegráfica	Bedienungszimmer fur die Drahtloseinstallation
Room, transmitting	Chambre des appareils de transmission	Locale di trasmissione	Sala de manipulacion	Senderraum

			Bastos	Packsattel
Screening box	Boîte de garde	Cassetta di protezione	Caja de resguardo	Schutzkasten
Series rheostat	Rhéostat en serie	Reostato in serie	Reostato en serie	Serien Widerstand
Ship station	Station de bord	Stazione navale	Estación de á bordo	Schiffstation
Short circuiting device	Dispositif de mise en court circuit	Dispositivo di messa in corto circuito	Dispositivo de corto circuito	Kurzschliesser
Shunt, highly inductive	Shunt à pouvoir inductif élevé	Shunt ad alta induzione	Shunt altamente inductivo	Shunt mit hohe Selbstinduktion
Shunt, non-inductive	Shunt, non-inductif	Circuito in derivazione non-induttivo	Shunt, no inductivo	Nebenschlusz induktionsfreier
Signals, balancing	—	Segnali equilibrati	Señales compensadores	Balanciersignale
Signals, telephone	Signaux téléphoniques	Segnali del telefono	Señales telefónicas	Telephonsignale
Span	Haubanage	Campata	Tirante.	Abspannung
Spark	Etincelle	Scintilla	Chispa	Funke
Spark coil, with hammer-break	Bobine d'induction à interrupteur à marteau	Rochetto d'induzione a martello	Bobina de chispa con interruptor de martillo	Funkeninduktor mit Hammerunterbrecher
Spark gap	Eclateur à étincelle	Oscillatore	Espacio de chispa	Funkenstrecke
Spark gap, micrometric	Eclateur à intervalle micromètique	Oscillatore micrometrico	Espacio micrometrico	Micrometer Funkenstrecke
Spark micrometer	Micromètre à étincelles	Micrometro di scintilla	Micrómetro de chispa	Funkenmikrometer
Spark gap, multiple	Eclateur en série	Oscillatore multiplo	Espacio de chispa múltiple	Unterteilte Funkenstrecke
Spark gap, quenched	Eclateur pour étincelle étouffée	Spinterometro per oscillazioni smorzate	Descargador de chispa extinguida	Gedaempfte Funkenstrecke
Spark quenched	Etincelle étouffée	Scintilla smaorzata	Chispa extinguida	Löschfunke
Sparking distance	Distance explosive	Distanza esplosiva	Distancia explosiva	Funkenstrecke
Specific inductive capacity	Capacité inductive spécifique	Capacità induttiva specifica	Capacidad inductiva específica	Dielectricitäts Konstante
Starter, automatic	Démarreur, automatique	Avviatore automatico	Reostato de arranque, automático	Selbstanlasser
Starter, combined with shunt regulator	Rhéostat de démarrage avec rhéostat de champ	Reostato di avviamento combinato con regolatore in derivazione	Reostato de arranque y regulador de campo combinados	Anlasswiderstand mit Nebenschlussregler
Starter, single-phase	Démarreur monophasé	Avviatore per corrente monofase	Reostato de arranque monofásico	Einphasenanlasser
Starter, three-phase	Démarreur tri-phasé	Avviatore per corrente trifase	Reostato de arranque trifásico	Dreiphasenanlasser
Station, aeroplane	Aéroplane (poste d')	Stazione per aeroplano	Estación para aeroplano.	Flug-zeug Station
Station, airship	Station de ballon dirigeable	Stazione per aeronave	Estación para globos dirigibles	Luftschiffstation
Station, cart type	Station du type sur voiture	Stazione del tipo su carri	Estación tipo de carros	Karren station. Fahrbar-[station
Station, cavalry	Poste de cavalerie	Stazione per cavalleria	Estación de cavaleria	Kavalleriestation
Station, high-power	Station à grande puissance	Stazione di grande potenza	Estación de gran potencia	Kraftstation
Station, knapsack	Poste dehavresac	Stazione da zaino	Estación de mochilas	Tornisterstation
Station, landing	Poste de débarquement	Stazione da sbarco	Estación de desembarco.	Landungsstation
Station, long-distance	Poste de grandes distances	Stazione ultrapotente	Estación de gran alcance.	Radiotelegraphische Grossstation
Station, portable	Station portative	Stazione portatile	Estación portátil	Tragbarestation

English.	French.	Italian.	Spanish.	German.
Station, portable military	Poste militaire transportable	Stazione militare mobile	Estación militar portátil	Tragbare Militärstation
Station, radiotelegraph	Poste radiotélégraphique	Stazione radiotelegrafica	Estación radiotelegráfica	Funkenamt
Station, small-power	Station à faible puissance	Stazione di piccola potenza	Estación de pequeña potencia	Kleinstation
Swiss commutator	Commutateur suisse	Commutatore tipo svizzero	Conmutador suizo	Schweizerische Kommutator
Switch, aerial change-over	Commutateur d'antenne	Commutatore dell'antenna	Conmutador para cambio de hilos de antena	Luftdrahtumschalter
Switch, aerial heating	Commutateur, échauffement d'antenne	Interruttore per riscaldamento dell'antenna	Conmutador de seguridad contra calentamiento de la antena	Umschalter zum heizen der Antenne
Switch, automatic	Interrupteur automatique	Interruttore automatico	Interruptor automático	Selbsttaetiger Schalte
Switch, automatic field break	Interrupteur automatique d'excitation	Interruttore automatico di eccitazione	Interruptor automático del campo	Selbsttaetiger Magnetausschalter
Switch, carbon break	Interrupteur à contacts de charbon	Interruttore a carbone	Interruptor con contactos de carbón	Kohlenschalter
Switch, change-over	Commutateur	Commutatore	Conmutador	Umschalter
Switch, change-tune	Commutateur de longeurs d'ondes	Commutatore di sintonizzazione	Conmutador de sintonización	Wellenumschalter
Switch, charging	Interrupteur de charge	Interruttore di carica	Conmutador de carga	Ladeschalter
Switch, combined fuse and	Interrupteur avec coupe circuit	Fusibile ed interruttore combinati	Interruptor con fusible	Schalter und Sicherung-kombiniert
Switch, double-bladed knife	Interrupteur bipolaire à lames	Interruttore doppio a coltello	Interruptor de cuchillo, bipolares	Doppelmesserschalter
Switch, double-pole	Interrupteur bipolaire	Interruttore bipolare	Interruptor bipolar	Zweipoliger Schalter
Switch, double pole, double throw	Commutateur bipolaire à deux directions	Interruttore bipolare a doppio effetto	Commutador bipolar de dos posiciones	Zweipoliger Umschalter
Switchboard, d.c. and a.c.	Tableau de distribution pour courant continu et alternatif	Quadro di distribuzione per corrente continua ed alternata	Cuadro de distribución de c.a. y c.c.	Schalttafel fuer Gleich und Wechselstrom
Switch, field-break	Interrupteur de l'excitation	Interruttore ad eccitazione	Interruptor del campo	Magnetausschalter
Switch, high-tension	Interrupteur pour haute tension	Interruttore per alta tensione	Interruptor de alta tensión	Hochspannungschalter
Switch, high-tension remote control	Téléinterrupteur pour haute tension	Interruttore ad alta tensione comandato a distanza	Teleinterruptor de alta tensión	Hochspannungsfernschalter
Switch, knife	Interrupteur unipolaire à lames	Interruttore a coltello	Interruptor de cuchillo	Messerschalter

[illegible]	Interrupteur à bain d'huile	Interruttore ad olio	Interruptor con baño de aceite	Oelschalter
Switch, press (toggle)	Interrupteur à pression	Interruttore a pressione	Interruptor de tornillo	Druckschalter
Switch, quick-break	Interrupteur à rupture brusque	Interruttore a scatto rapido	Interruptor de rotura brusca	Momentschalter
Switch, single-pole	Interrupteur unipolaire	Interruttore unipolare	Interruptor monopolar	Einpoligerschalter
Switch, three-phase	Interrupteur pour courant tri-phasé	Interruttore tripolare	Interruptor trifásico	Drehstromschalter
Switch, three-way	Commutateur à trois directions	Commutatore a tre vie	Conmutador de tres pasos	3 Wege Umschalter
Switch, voltmeter	Interrupteur du voltamètre	Interruttore per voltometro	Interruptor para voltímetro	Voltmeterumschalter
Switch, wave-changing	Commutateur pour changement de longeur d'onde	Commutatore d'onda	Conmutador de cambio de onda	Wellen Umschalter
Syntonisation	Syntonisation	Sintonizzazione	Sintonización	Abstimmung
Syntonised wireless telegraphy	Télégraphie sans fil syntonisée	Radiotelegrafia sintonica	Telegrafía sin hilos sintonizada	Abstimmbare Drahtlose-telegraphie
Table, operating	Table de manipulation	Tavola per il servizio radio-telegrafico	Mesa de aparatos	Radiotelegrafischer Bedienungstisch(Apparattisch)
Tapper	Frappeur	Decoherer	Decohesor de martillo	Klopfer
Telegraphy, directional wireless	Radiotélégraphie dirigée	Radiotelegrafia a sistema dirigibile	Telegrafía sin hilos dirigida	Gerichtete Drahtlose Telegraphie
Three-electrode valve	Soupape à trois electrodes	Vuoto a tre elettrodi	—	Vakuum röhre mit drei electroden
Trailing aerial	Antenne pendante (pour avion)	Coda d'aereo	Antena colgante	Freihängende Antenne
Transformer	Transformateur	Trasformatore	Transformador	Transformator
Transformer, high-frequency oscillation	Transformateur d'oscillation à haute fréquence	Trasformatore delle correnti oscillatorie ad alta frequenza	Transformador de oscilaciones de alta frecuencia	Umformer fuer Hochfrequenzschwingungen
Transformer, oscillatory	Transformateur d'oscillation	Trasformatore delle correnti oscillatorie	Transformador oscilatorio	Oscillationsumformer
Transmitting arrangement	Dispositif d'emission	Dispositivo di trasmissione	Dispositivo de transmision	Senderanordnung
Transmitter, cavalry	Transmetteur pour cavalerie	Trasmettitore di stazione per cavalleria	Transmisor para estación de cavaleria	Kavalleriesendeapparat
Transmitter, inductive	Transmetteur à couplage inductif	Trasmettitore ad accopiamento induttivo	Transmisor de acoplamiento de induccion	Gekoppelte Sender
Transmitter, sharply tuned	Transmetteur à syntonisation aiguë	Trasmettitore acutamente sintonizzato	Transmisor de sintonización aguda	Scharf abgestimmte Sender
Transmitter, simple (P.A.)	Dispositif d'emission directe	Trasmettitore semplice	Transmisor sencillo	Einfacher Sender
Tremblers	Trembleurs	Interruttore a martello	Tembladores	—

ENGLISH.	FRENCH.	ITALIAN.	SPANISH.	GERMAN.
Trembler, cantilever	—	—	Temblador de canecillo	—
Trench, covered in for wiring	Canalisation souterraine	Fossa coperta per cavi elettrici	Zanja cubierta para cables	Abgedeckter Kabelgraben
Tube, ebonite	Tube en ébonite	Tubo di ebanite	Tubo de ebonita	Ebonitroehre
Tuning	Syntonisation	Sintonizzazione	Sintonización	Abstimmen
Tuning, flat	Syntonisation non aiguë	Sintonizzazione piana	Sintonización aplastada	Unscharfes Abstimmen
Tuner, multiple	Syntonisateur multiple	Sintonizzatore multiplo	Sintonizador múltiple	Vielfach Abstimmapparat
Tuning, note	Hauteur de la note	Sintonizzazione della nota	Sintonización de la nota	Tonhöhe der Abstimmung
Tuning, note and wave	Note et onde de syntonisation	Sintonizzazione della nota e dell' onda	Sintonización de la nota y de la onda	Abstimmen von Tonhöhe und Welle
Tuning wave	Onde de syntonisation	Sintonizzazione della onda	Sintonización de la onda	Welle der Abstimmung
Two or three valve amplifier	Amplificateur à deux ou trois étages	—	—	—
Undamped wave. (*See* Continuous wave.)				
Valve	Valve	Valvola	Válvula	Ventil
Valve, vacuum	Valve à vide	Valvola a vuoto	Válvula de vacio	Vakuumventil
Voltage	Voltage	Potenziale	Voltaje	Spannung
Voltmeter, a.c.	Voltmètre pour courant alternatif	Voltometro per corrente alternata	Voltímetro c.a.	Voltmeter fur Wechselstrom
Voltmeter, aperiodic	Voltmètre apériodique	Voltometro aperiodico	Voltímetro aperiodico	Aperiodisches Voltmeter
Voltmeter, d.c.	Voltmètre pour courant continu	Voltometro per corrente continua	Voltímetro c.c.	Voltmeter fuer Gleichstrom
Voltmeter, hot-wire	Voltmètre à fil chaud	Voltometro a filo caldo	Voltímetro térmico	Hitzdrahtvoltmeter
Voltmeter, switch	Interrupteur de voltmètre	Interruttore per voltometro	Voltímetro, interruptor para	Voltmeterumschalter
Wagon apparatus	Voiture portant les appareils	Carro per gli apparecchi	Aparatos sobre carros	Apparatekarren
Wagon, dynamo	Voiture portant le générateur	Carro per il generatore	Dinamo sobre carros	Kraftkarren-Kraftwagen
Wave frequency	Fréquence des ondes	Frequenza dell'onda	Frecuencia de onda	Wellen frequenz
Wavelength	Longueur d'onde	Lunghezza d'onda	Longitud de onda	Wellenlaenge
Wavemeter	Ondemètre	Ondametro	Ondámetro	Wellenmesser
Waves, radiation of	Radiation des ondes	Irradiamento di onde	Radiación de las ondas	Ausstrahlung der Wellen

GENERAL INFORMATION AND USEFUL TABLES

INTERNATIONAL RULES FOR THE USE OF SYMBOLS REPRESENTING QUANTITIES IN MATHEMATICAL CALCULATIONS

(*a*) Instantaneous values of electrical quantities which vary with the time to be represented by small letters. In case of ambiguity they may be followed by the subscript "t."

(*b*) Virtual or constant values of electrical quantities to be represented by capital letters.

(*c*) Maximum values of periodic electrical and magnetic quantities to be represented by capital letters followed by the subscript "m."

(*d*) In cases where it is desirable to distinguish between magnetic and electric quantities, constant or variable, magnetic quantities to be represented by capital letters of either script, heavy-faced or any special type. Script letters to be only employed for magnetic quantities.

(*e*) Angles to be represented by small Greek letters.

(*f*) Dimensions and special quantities to be represented, wherever possible, by small Greek letters.

THE "MILE" EQUIVALENTS OF VARIOUS NATIONS

	English Yards.
Arabian mile	2,148
Bohemian mile	10,137
Brabant mile	6,082
Burgundy mile	6,183
Chinese li	629
Danish mile	8,244
Dutch mile	6,395
English mile, statute	1,760
English mile, geographical	2,025
Flemish mile	6,869
French posting league	4,263
French marine league	6,075
French legal league of 2,000 toises	4,263
German mile, geographical	8,100
German mile, long	10,126
German mile, short	6,859
Hamburg mile	8,244
Hanoverian mile	11,559
Hesse mile	19,547
Hungarian mile	9,115
Irish mile	2,240
Italian mile	2,025
Poland mile, short	6,071
Poland mile, long	8,100
Portuguese legoa	6,760
Prussian mile	8,237
Roman mile, modern	2,028
Russian verst	1,167
Saxon mile	9,904

WEIGHTS AND MEASURES.

AVOIRDUPOIS WEIGHT.

drachms.	oz.	lb.	qrs.	cwts.	ton.	grammes.
1 =	·0625 =	·0039 =	·000139 =	·000035 =	·00000174 =	1·771846
16 =	1 =	·0625 =	·00223 =	·000558 =	·000028 =	28·34954
256 =	16 =	1 =	·0357 =	·00893 =	·000447 =	453·59
7168 =	448 =	28 =	1 =	·25 =	·0125 =	12,700
28672 =	1792 =	112 =	4 =	1 =	·05 =	50,802
573440 =	35840 =	2240 =	80 =	20 =	1 =	1,016 048

TROY WEIGHT.

grains.	dwts.	oz.	lb.	grammes.
1 =	·04167 =	·00208 =	·0001736 =	·0648
24 =	1 =	·05 =	·004167 =	1·555
480 =	20 =	1 =	·0833 =	31·1035
5760 =	240 =	12 =	1 =	373·242

7,000 grains troy = 1 lb. avoirdupois
175 lb. troy = 144 lb. avoirdupois
lb. avoirdupois × 1·2153 = lb. troy
lb. troy × ·82286 = lb. avoirdupois

LONG MEASURE.

in.	feet.	yards.	fath.	poles.	furl.	mile.	metres.
1 =	·083 =	·02778 =	·0139 =	·005 =	·000126 =	·0000158 =	·0254
12 =	1 =	·333 =	·1667 =	·0606 =	·00151 =	·0001894 =	·3048
36 =	3 =	1 =	·5 =	·182 =	·00454 =	·000568 =	·9144
72 =	6 =	2 =	1 =	·364 =	·0091 =	·001136 =	1·8287
198 =	16½ =	5½ =	2¾ =	1 =	·025 =	·003125 =	5·0291
7920 =	660 =	220 =	110 =	40 =	1 =	·125 =	201·16
63360 =	5280 =	1760 =	880 =	320 =	8 =	1 =	1609·315

MEASURE OF CAPACITY.

pints.	gall.	peck.	bushel.	quarter.	wey.	last.	cub. ft.	litres.
1 =	·125 =	·0625 =	·01562 =	·00195 =	·00039 =	·000195 =	·02 =	·5676
8 =	1 =	·5 =	·125 =	·0156 =	·00312 =	·00156 =	·1604 =	4·543
16 =	2 =	1 =	·25 =	·03125 =	·00625 =	·00312 =	·3208 =	9·082
64 =	8 =	4 =	1 =	·125 =	·025 =	·0125 =	1·283 =	36·32816
512 =	64 =	32 =	8 =	1 =	·2 =	·1 =	10·264 =	290·625
2560 =	320 =	160 =	40 =	5 =	1 =	·5 =	51·319 =	1453·126
5120 =	640 =	320 =	80 =	10 =	2 =	1 =	102·64 =	2906·25

1 gallon in wine, ale, or dry measure
= 277¼ cubic inches = ·16 cubic foot
= 10 lb. of distilled water =
Cube feet × 6·2355 = gallons.
Cube ins. × ·003607 = gallons.
1 bushel = 2218.19 cube inches = 1.28 cube foot.
Cube feet = ·78 = bushels.
Cube ins. × ·00045 = bushels.

SQUARE OR SURFACE MEASURE.

144 square inches = 1 square foot.
9 square feet = 1 square yard.
30¼ square yards = 1 square rod or perch.
40 square rods = 1 rood.
4 roods = 1 acre (4,840 square yards).
640 acres = 1 square mile (3,097,600 square yards).

METRIC SYSTEM OF WEIGHTS AND MEASURES.

The Metric System is based upon the estimated length of the fourth part of a terrestrial meridian. The ten-millionth part of this arc is called a *Metre*, and is the unit of length. The cube of the tenth part of a metre was adopted as

the unit of capacity, and denominated a *Litre*. The weight of a litre of distilled water at its greatest density was called a *Kilogramme*, of which the thousandth part, or *Gramme*, was adopted as the unit of weight. The multiples of these, proceeding in decimal progression, are distinguished by the employment of the prefixes *deca*, *hecto*, *kilo*, and *myria*, and the subdivisions by *deci*, *centi*, and *milli*. The units in general use are as follows :—

MEASURES OF LENGTH (UNIT METRE).

Equal to	Metre.	Inches.	Feet.	Yards.	Miles.
Millimetre	0·001	0·039	0·003	0·001	0·000
Centimetre	0·010	0·393	0·032	0·010	0·000
Metre	1·000	39·370	3·280	1·093	0·000
Kilometre	1000·000	39370·790	3280·899	1093·633	0·621

CUBIC, OR MEASURES OF CAPACITY (UNIT LITRE).

Equal to	Cubic inches.	Cubic feet.	Pints.	Gallons.
Cubic Centimetre	0·061	0·000	0·001	0·000
Litre, or cubic decimetre ..	61·027	0·035	1·760	0·220
Cubic Metre	61027·051	35·316	1760·773	220·096

MEASURES OF WEIGHT (UNIT GRAMME).

Equal to	Grains.	Avoirdupois lb.	Cwt. = 112 lb.	Tons = 20 cwt.
Milligramme	0·015	0·000	0·000	0·0000
Gramme	15·432	0·002	0·000	0·0000
Kilogramme	15432·348	2·204	0·019	0·0009
Tonne = 1,000 kilogs.	—	2204·000	19·678	0·9839

SQUARE OR SURFACE MEASURE.

Equal to	Square feet.	Square yards.
Square Metre .. = ...	10·7643	1·196

Hectare = 10,000 sq. met. = 11,960 sq. yds. = 2·47 acres.

The Metric System of Weights and Measures, which, as plainly demonstrated in the preceding pages, is logically symmetrical, now forms the usual standard in the following countries :—

*Argentine Republic.
Austria-Hungary.
Belgium.
*Bolivia.
*Brazil.
*Chile.
*Colombia.
Denmark.
Egypt.
France.
German Empire.
†Greece.
Holland.
Italy.
*Mexico.
Norway.
*Peru.
Portugal.
†Roumania.
Servia.
*Spain.
Sweden.

* Old Spanish measures also occasionally used are :—

Onza	=	1·014 ounce avoirdupois.
Libra	=	1·014 lb. avoirdupois.
Quintal	=	101·44 lb. avoirdupois.
Arroba (of 25 libras)	=	25·36 lb. avoirdupois.
Arroba of Wine	=	6·70 Imperial gallons.
Gallon	=	0·74 Imperial gallon.
Vara	=	0·927 yard.
Square Vara	=	0.859 square yard.

† Turkish measures are also in use :—

Oke of 410 drams	=	2·8283 lb. avoirdupois.
Almud	=	1·151 Imperial gallons.
Kileh	=	0·9120 Imperial gallon.
44 okes = 1 Cantar	=	124·3616 lb. avoirdupois.
39·6263 okes	=	1 cwt.
180 okes = 1 Tcheke	=	509·095 pounds.
1 kileh = 20 okes	=	0·36 Imperial quarter.
816 kilehs	=	100 Imperial quarters.

The following countries have not adopted the Metric System :—

CANADA.—The legal Weight and Measures are the Imperial Yard, Imperial pound avoirdupois, Imperial gallon, and the Imperial bushel. By Act 42 Vict., cap. 16, the British hundredweight of 112 pounds and the ton of 2,240 pounds were abolished, and the hundredweight was declared to be 100 pounds, and the ton 2,000 pounds avoirdupois as in United States, but sometimes contracts stipulate for the British weights.

CHINA.—

Weights— 10 Ch'ien = 1 Liang (Tael) = 1·333 oz. avoirdupois or 37·78 grammes

16 Liang = 1 Kin (Catty) = 1·333 lb. avoirdupois or 604·53 grammes

100 Chin = 1 Tan (Picul) = 133·333 lb. avoirdupois or 60·453 kilogrammes

4 ozs. = 3 taels; 1 lb. = ¾ catty or 12 taels; 1 cwt. = 84 catties; 1 ton = 16 piculs 80 catties

Capacity—10 Ko .. .. = 1 Sheng (pint) = 1·031 litre

10 Sheng .. = 1 Tou (peck) = 10·31 litre (holding from 6½ to 10 Kin of rice and measuring from 1·13 to 1·63 gallon)

Commodities, even liquids, such as oil, spirits, etc., are commonly bought and sold by weight.

Length—10 Fen .. .. = 1 Ts'un (inch)

10 T'sun .. = 1 Chi'h (foot) = 14·1 English inches by treaty

10 Chi'h.. .. = 1 Chang = 11 ft. 9 in. (141 in. by treaty)

1 Li .. .. = ⅓ English mile (about)

The mow, the unit of measurement, is almost exactly one-sixth of an acre.

In the tariff settled by treaty between Great Britain and China, the Chi'h of $14\frac{1}{10}$ English inches has been adopted as the legal standard. The standards of weight and length vary all over the Empire, the Chi'h ranging from 9 to 16 English inches, and the Chang (= 10 Chi'h) in proportion; at the treaty ports, the use of foreign treaty standard of Chi'h and Chang is common.

In October, 1907, a decree for uniform weights and measures was issued, making the K'up'ing or Treasury Scale the standard weight. The K'up'ing tael or ounce weighs 575·64 grains. The Haikwan tael weighs 581·47 grains.

INDIA.—The Maund of Bengal.

40 Seers .. .. .. = $82\frac{2}{7}$ lb. avoirdupois

The Maund of Madras .. = 25 lb. avoirdupois (nearly)

The Tola .. .. .. = 180 grains troy

The Guz of Bengal .. = 36 inches

An Act to provide for the adoption of an uniform system of weights and measures was passed in 1871. The Act orders: "Art. 2. The primary standard of weight shall be called a seer, and shall be a weight of metal in the possession of the Government of India, equal, when weighed in a vacuum, to the weight known in France as the kilogramme = 2·205 lb. avoirdupois." "Art. 3. The units of weight and measures of capacity shall be, for weights, the said

seer; for measures of capacity, a measure containing one such seer of water at its maximum density, weighed in a vacuum. Unless it be otherwise ordered, the subdivisions of all such weights and measures of capacity shall be expressed in decimal parts." This Act, however, has never been in operation.

JAPAN.—

The Mommé	= 2·11 drams or 2·41 dwts. or 120 mommé = 1 lb. avoirdupois
The Kin (Catty) = 160 mommé	= 1·322 lb. avoirdupois (0·266 mommé = 1 gramme) or 1·60 lb. troy
The Picul (100 kin)	= 132·27 lb.
The Kwan = 1,000 mommé ..	= 8·261 lb. avoirdupois or 10·04 lb. troy
The Shaku	= ·994 foot (3·3 shaku = 1 metre)
The Kujira Shaku	= 1·242 feet
The Sün	= 1·193 inches
The Ken = 6 Shaku	= 5·965 feet
The Jo = 10 Shaku	= 9·942 feet
The Chô = 60 Ken	= 357·916 feet, or about $\frac{1}{15}$ mile
The Ri = 36 Chô	= 2·44 miles
The Ri (marine)	= 1·15 mile
The Ri (square)	= 5·9552 square miles
The Chô = 10 tan	= 2·45 acres
The Koku, Liquid = 10 To = 100 Sho	= 39·7033 gallons
The Koku, Dry	= 4·9629 bushels
The Koku (capacity of vessel)	= $\frac{1}{10}$ ton
The To, Liquid	= 3·9703 gallons
The To, Dry	= 1·9851 peck

RUSSIA.—

1 Verst (500 sajènes)	= 3,500 feet, or two-thirds of a statute mile
1 Sajène (3 arshins)	= 7 feet
1 Arshin (16 vershok) ..	= 28 inches
1 Square Verst	= 0·43941 square mile
1 Dessiatine	= 2·69972 acres
1 Pound (96 zolotniks = 32 lot)	= $\frac{9}{10}$ of a pound or 14·4 ounces
1 Pood (40 pounds)	= 36·113 lb. = 0·32244 cwt. or 100 poods = 1·6121 tons. Baltic Freight is usually quoted per ton of 62 poods
1 Vedro (8 shtoffs)	= 2¾ Imperial gallons
1 Chetvert (8 chetveriks) ..	= 5·77 Imperial bushels or 46·2 gals.

UNITED STATES.—

British weights and measures are usually employed, but the old Winchester gallon and bushel are used instead of the new or Imperial standards. Different States have a legal standard for bushels of certain articles, such as grain and potatoes, varying from 60 lb. for wheat to 32 for oats.

Wine gallon	=0·83333 gallon
Ale gallon	=1·01695 gallon
Bushel	=0·9692 Imperial bushel

Instead of the British cwt. a central of 100 lb. is used. 1 ton = 2,000 lb., except coal, which is usually 2,240 lb. wholesale.

NAUTICAL MEASURES

(*From " Lloyd's Calendar," by permission of the Committee of Lloyd's.*)

12 inches	= 1 foot	6 feet	= 1 fathom
3 feet	= 1 yard	3 nautical miles ..	= 1 league

Sea or Nautical Mile = one-sixtieth of a degree of latitude, and varies from 6,046 ft. on the Equator to 6,092 ft. in lat. 60°

Nautical Mile for speed trials, generally called the Admiralty Measured Mile { 6,080 feet; 1.151 statute miles; 1,853 metres

Cable's length = the tenth of a nautical mile; or, approximately, 100 fathoms or 200 yards.

A Knot = a nautical mile an hour, is a measure of speed, but is not infrequently, though erroneously, used as synonymous with a nautical mile.

Length of European Measures of Distances compared with the Nautical Mile of 6,080 *ft.*

	Length in Nautical Miles.		Length in Nautical Miles.
Nautical Mile	1·000	German Ruthen	4·064
British Statute Land Mile	0·868	Italian Mile	1·000
Austrian Mile	4·094	Norwegian Mile	6·097
Danish Mile..	4·064	Russian Verst	0·576
French Kilometre	0·539	Swedish Mile	5·769
German Geographical Mile	4·000		

DISTANCE OF HORIZON AT SEA.

Let h be the height of the observer's eye above sea level, D the distance to the horizon, and R the earth's radius.

Then

$$D^2 = 2Rh$$

And thus D in statute miles $= 1{\cdot}22\ \sqrt{h}$ in feet

D in kilometres $= 2{\cdot}52\ \sqrt{h}$ in metres

An object of height h^1 is seen by an eye at height h at a distance D^1 given by

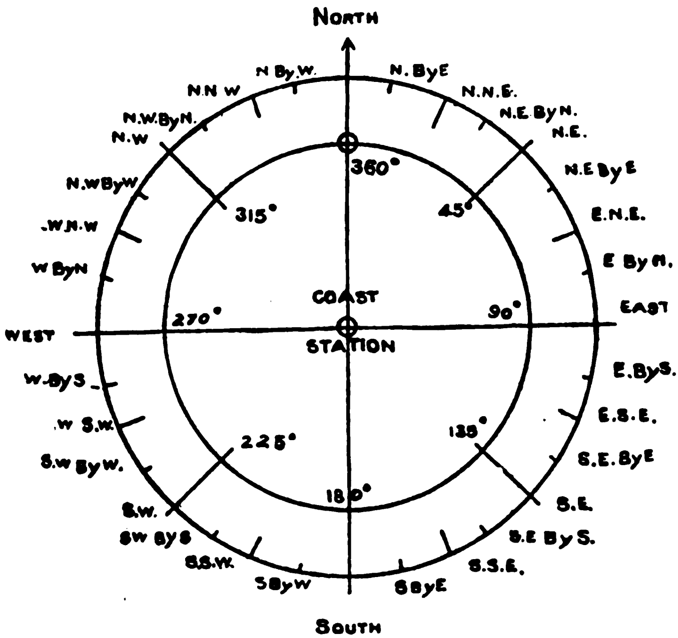
D^1 in statute miles $= 1{\cdot}22\ \sqrt{h}$ in feet $+ \sqrt{h^1}$ in feet

D^1 in kilometres $= 2{\cdot}52\ \sqrt{h}$ in metres $+ \sqrt{h^1}$ in metres

The distance of the horizon—*i.e.*, the greatest distance at which the surface of the sea is visible—varies somewhat with refraction in the atmosphere.

METHOD OF DENOTING THE TRUE BEARING AND COURSE OF A SHIP AT SEA

As regards the true bearing *of* the ship *from* the coast station, the degrees are reckoned " clockwise " from north round through east, south and west.



Thus, if the ship's *bearing* from the coast station is anything between north and east, the number to be signalled will be between 0 and 90.

Between east and south the number will be between 90 and 180.

Between south and west the number will be between 180 and 270.

Between west and north the number will be between 270 and 360.

Similarly, if the ship's *course* is between N. and E. the number to be signalled will be between 0 and 90.

Between E. and S. the number to be signalled will be between 90 and 180.

Between S. and W. the number to be signalled will be between 180 and 270.

Between W. and N. the number to be signalled will be between 270 and 360.

To facilitate the conversion of the bearing and course into the number of degrees to be signalled, a table is appended in which either the bearing of the ship from the coast station, or the bearing of the coast station from the ship can be ascertained and the number of degrees to be signalled seen at a glance. The course must be looked for in the same column as the bearing *of* the ship *from* the coast station.

Thus a ship 150 miles bearing S 75° W. from a coast station and steaming S. 85° E. at 15 knots, and having telegrams comprising 75 words to send, on receiving the signal to Go (— • —) from the coast station, would signal the following :—

— • — • — XYZ — • • • • ABC 150 255

95 15 75 • — • — •

(end).

TABLE TO CONVERT BEARING AND COURSE INTO DEGREES.

Course of Bearing of Ship from Coast Station.	Bearing of Coast Station from Ship.	Degrees to be Signalled.
North	South	0°
N. 10° E.	S. 10° W.	10°
20°	20°	20°
30°	30°	30°
40°	40°	40°
50°	50°	50°
60°	60°	60°
70°	70°	70°
80°	80°	80°
East	West	90°
S. 80° E.	N. 80° W.	100°
70°	70°	110°
60°	60°	120°
50°	50°	130°
40°	40°	140°
30°	30°	150°
20°	20°	160°
10°	10°	170°
South	North	180°
S. 10° W.	N. 10° W.	190°
20°	20°	200°
30°	30°	210°
40°	40°	220°
50°	50°	230°
60°	60°	240°
70°	70°	250°
80°	80°	260°
West	East	270°
N. 80° W.	S. 80° E.	280°
70°	70°	290°
60°	60°	300°
50°	50°	310°
40°	40°	320°
30°	30°	330°
20°	20°	340°
10°	10°	350°
North	South	360° or 0

AREAS AND CIRCUMFERENCES OF CIRCLES ADVANCING BY ONE-TENTHS—I.

Diam.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.
	·0	·0	·1	·1	·2	·2	·3	·3	·4	·4
0	·0	·00	·07	·31	·03	·62	·07	·94	·12	1·25
1	·78	3·14	·95	3·45	·13	3·77	1·32	4·08	1·53	4·39
2	·3·14	6·28	3·46	6·59	3·80	6·91	4·15	7·22	4·52	7·53
3	7·06	9·42	7·54	9·74	8·04	10·05	8·55	10·36	9·07	10·66
4	12·56	12·56	13·20	12·88	13·85	13·19	14·52	13·50	15·20	13·82
5	19·63	15·70	20·42	16·02	21·23	16·33	26·06	16·65	22·90	16·96
6	28·27	18·84	29·22	19·16	30·19	19·47	31·17	19·79	32·16	20·10
7	38·48	21·99	39·59	22·30	40·71	22·61	41·85	22·93	43·00	23·24
8	50·26	25·13	51·53	25·44	52·81	25·76	54·10	26·07	55·41	26·38
9	63·61	28·27	65·03	28·58	66·47	28·90	67·92	29·2	69·30	29·53
10	78·53	31·41	80·11	31·73	81·71	32·04	83·32	32·35	84·94	32·67

AREAS AND CIRCUMFERENCES OF CIRCLES ADVANCING BY ONE-TENTHS—II.

Diam.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.	Areas	Circ.
	·5	·5	·6	·6	·7	·7	·8	·8	·9	·9
0	·19	1·57	·28	1·88	·38	2·19	·50	2·51	·63	2·82
1	1·76	4·71	2·01	5·02	2·26	5·34	2·54	5·65	2·83	5·96
2	4·90	7·85	5·30	8·16	5·72	8·48	6·15	8·79	6·60	9·11
3	9·62	10·99	10·17	11·30	10·75	11·62	11·34	11·93	11·94	12·25
4	15·90	14·13	16·61	14·45	17·34	14·76	18·09	15·08	18·85	15·39
5	23·75	17·37	24·63	17·59	25·51	17·90	26·42	18·22	27·33	18·53
6	33·18	20·12	34·21	20·73	35·25	21·04	36·31	21·36	37·39	21·67
7	44·17	23·56	45·36	23·87	46·56	24·19	47·78	24·50	49·01	24·81
8	46·74	26·70	58·08	27·01	59·44	27·33	60·82	27·64	62·21	27·96
9	70·88	29·84	72·38	30·15	73·89	30·47	75·42	30·78	76·97	31·10
10	86·59	32·98	88·24	33·30	89·92	33·61	91·60	33·92	93·31	34·24

LENGTH OF A DEGREE IN LATITUDE AND LONGITUDE.

Lat.	Degree of Longitude.		Degree of Latitude.		Lat.	Degree of Longitude.		Degree of Latitude.	
°	Stat. Miles.	Naut. Miles.	Stat. Miles.	Naut. Miles.	°	Stat. Miles.	Naut. Miles.	Stat. Miles.	Naut. Miles.
0	69·160	60·000	68·698	59·600	45	48·986	42·498	69·044	59·899
2	·119	59·964	·699	·601	47	47·251	40·993	·068	·920
4	68·992	·855	·702	·603	49	45·459	39·439	·092	·941
6	·783	·673	·706	·607	51	43·611	37·835	·116	·962
8	·491	·419	·712	·612	53	41·710	36·186	·140	·982
10	·116	·093	·719	·618	55	39·758	34·491	·162	60·002
12	67·659	58·697	·728	·625	57	37·756	32·755	·184	·022
14	·120	·229	·738	·634	59	35·707	30·979	·206	·041
16	66·499	57·690	·750	·645	61	33·615	29·164	·228	·059
18	65·797	·081	·764	·657	63	31·481	27·311	·248	·077
20	·015	56·404	·779	·669	65	29·308	25·425	·268	·094
22	64·154	55·657	·795	·683	67	27·100	23·509	·286	·110
24	63·216	54·843	·813	·699	69	24·857	21·564	·302	·124
26	62·201	53·962	·831	·715	71	22·582	19·593	·318	·137
28	61·110	·016	·850	·731	73	20·282	17·597	·333	·149
30	59·944	52·005	·870	·749	75	17·956	15·578	·345	·161
32	58·706	50·931	·892	·767	77	15·607	13·539	·357	·171
34	57·396	49·794	·914	·786	79	13·238	11·484	·367	·179
36	56·016	48·597	·936	·806	81	10·853	9·417	·375	·186
38	54·568	47·340	·959	·826	83	8·456	7·338	·381	·192
40	53·053	46·026	·983	·846	85	6·048	5·248	·387	·196
42	51·473	44·656	69·007	·866	87	3·632	3·151	·390	·199
44	49·830	43·231	·013	·888	89	1·211	1·050	·392	·201

MEASURES OF TIME

The earth's axial rotation is the phenomenon by which time is measured everywhere on the earth's surface. Experiment and observation show that if we assume the earth to rotate uniformly, there are many other phenomena which are as accurately isochronous in their periodicity. That is to say, they pass again and again through all their phases in exactly the same interval of time as measured in terms of the earth's rotation. In the pendulum of a clock and the balance wheel of a watch we have such isochronism very approximately realised. A little consideration will convince us that the measurement of time is really a comparison of periodic sequences. We cannot conceive any other mode of marking off time intervals than by some kind of motion of a periodic character. Our practical unit of time is essentially terrestrial.

Sidereal Day.—The standard unit of time is the Sidereal Day, being the period in which the earth turns once round on its axis. It is divided into sidereal hours, minutes, and seconds; but these measures of time are used by astronomers only.

Mean Solar Time.—A Second is the time of one swing of a pendulum adjusted so as to make 86,164·09 swings in a sidereal day. Seconds are usually subdivided decimally.

One Mean solar day = 24 hours = 1,440 minutes = 86,400 seconds = 1·00273791 sidereal day.

Relation between Time and Longitude.—At any given instant the mean solar time at two stations differ by an amount proportional to their difference of longitude, the time at the eastern station being the earlier.

Corresponding Differences.

Longitude.	Time.	Longitude.	Time.
15″	1 second.	75°	5 hours.
1′	4 seconds.	90	6 ,,
15′	1 minute.	105	7 ,,
1°	4 minutes.	120	8 ,,
15°	1 hour.	135	9 ,,
30	2 hours.	150	10 ,,
45	3 ,,	165	11 ,,
60	4 ,,	180	12 ,,

To show the exact date of any event, the meridian at which the time is reckoned must be specified. One degree longitude at Equator = 60 nauts = 69·17 statute miles.

STANDARD OR ZONE TIME.

Country.	Central Meridian.	Fast or Slow on Greenwich Time.*
Western Europe, Algeria	0°	Greenwich Time
Central Europe, Tunis, Congo, Angola, German South-West Africa	15° E.	1 h. fast
Eastern Europe, British South Africa, Egypt, Portuguese East Africa	30° E.	2 h. fast
Mauritius, Reunion and Seychelles	60° E.	4 h. fast
India (except Calcutta) and Ceylon	82½° E.	5½ h. fast
Calcutta	90° E.	6 h. fast
Burmah	97½° E.	6½ h. fast
Federated Malay States, Straits Settlements, and French Indo-China	105° E.	7 h. fast
Java	109° 48′ 37.5″ E.	7 h. 19 m. 14.5 s. fast
Western Australia, Hong-Kong, East Coast of China, Kiau Chau, Philippine Islands, British North Borneo, Labuan	120° E.	8 h. fast
Korea	127° 30′ E.	8½ h. fast
Japan, Seoul, and Chemulpo	135° E.	9 h. fast
South Australia and Guam	142° 30′ E.	9½ h. fast
New South Wales, Queensland, Tasmania, Victoria, New Guinea, and Caroline Island	150° E.	10 h. fast
New Zealand	172½° E.	11½ h. fast
Ascension	14° 15′ W.	57m. slow
Iceland, Madeira, Liberia and Portuguese Guinea	15° W.	1 h. slow
America:		
Atlantic (New Brunswick, Nova Scotia, Prince Edward Island, Grenada, Trinidad, etc.)	60° W.	4 h. slow
Eastern (Eastern U.S., Chili, Panama, Peru, etc.)	75° W.	5 h. slow
Central	90° W.	6 h. slow
Mountain	105° W.	7 h. slow
Pacific (British Columbia, etc.)	120° W.	8 h. slow
Alaska	135° W.	9 h. slow
Hawaii or Sandwich Islands	157° 30′ W.	10½ h. slow
Samoa	172½° W.	11½ h. slow

* Greenwich time is used in France, Spain, Portugal, Belgium, Gibraltar, and the Faroes.

BELL TIME ON BOARD SHIP.

The nautical day begins at noon and is divided into "**watches**" of four hours each, time being indicated by bells striking every half-hour.

A.M.	A.M.	A.M.		P.M.	P.M.	P.M.
12.30	4.30	8.30....1	BELL	12.30	4.30	8.30
1.00	5.00	9.00....2	BELLS....	1.00	5.00	9.00
1.30	5.30	9.30....3	BELLS....	1.30	5.30	9.30
2.00	6.00	10.00....4	BELLS....	2.00	6.00	10.00
2.30	6.30	10.30....5	BELLS....	2.30	6.30	10.30
3.00	7.00	11.00....6	BELLS....	3.00	7.00	11.00
3.30	7.30	11.30....7	BELLS....	3.30	7.30	11.30
4.00	8.00	NOON... 8	BELLS....	4.00	8.00	MIDNIGHT.

One of these four-hour watches is divided into two "**dog watches**":—

(1) From 4 to 6 p.m.
(2) From 6 to 8 p.m.

The hours for the "dog watches" are:—

4 BELLS........................	6.00 p.m.
1 BELL	6.30 p.m.
2 BELLS........................	7.00 p.m.
3 BELLS........................	7.30 p.m.

CONCISE TABLES OF CONTINENTAL MONEYS.

(*Extracted by permission from Bradshaw's Continental Guide.*)

(1) A Concise Table of Foreign Moneys, Reduced from English into the Currency of Other Countries at Par.

England.	France, Italy, Belgium, Switzerland.	Germany.	Holland.	United States.	Austria in Notes.	Russia in Notes.
£ s. d.	Frs. Cts.	Mks. Pfg.	Fl. Cts.	Dols. Cts.	Kronen.	Roubles.
0 0 0½	0 052	0 04	0 02	0 01	·04	·01
0 0 1	0 104	0 08	0 05	0 02	·08	·03
0 0 2	0 208	0 17	0 10	0 04	·18	·07
0 0 3	0 312	0 25	0 15	0 06	·26	·10
0 0 4	0 416	0 33	0 20	0 08	·38	·14
0 0 5	0 520	0 42	0 25	0 10	·48	·16
0 0 6	0 625	0 50	0 30	0 12	·56	·21
0 0 7	0 729	0 58	0 35	0 14	·66	·25
0 0 8	0 833	0 67	0 40	0 16	·76	·28
0 0 9	0 937	0 75	0 45	0 18	·86	·32
0 0 10	1 040	0 84	0 50	0 20	·96	·36
0 0 11	1 144	0 92	0 55	0 23	1·04	·39
0 1 0	1 25	1 0	0 60	0 25	1·20	·47
0 2 0	2 50	2 0	1 20	0 50	2·40	·95
0 3 0	3 75	3 0	1 80	0 75	3·60	1·42
0 4 0	5 0	4 0	2 40	1 0	4·80	1·90
0 5 0	6 25	5 0	3 0	1 25	6·	2·37
0 6 0	7 50	6 0	3 60	1 50	7·20	2·85
0 7 0	8 75	7 0	4 20	1 75	8·40	3·32
0 8 0	10 0	8 0	4 80	2 0	9·60	3·80
0 9 0	11 25	9 0	5 40	2 25	10·80	4·27
0 10 0	12 50	10 0	6 0	2 50	12·	4·75
0 11 0	13 75	11 0	6 60	2 75	13·20	5·22
0 12 0	15 0	12 0	7 20	3 0	14·40	5·70
0 13 0	16 25	13 0	7 80	3 25	15·60	6·17
0 14 0	17 50	14 0	8 40	3 50	16·80	6·65
0 15 0	18 75	15 0	9 0	3 75	18·	7·12
0 16 0	20 0	16 0	9 60	4 0	19·20	7·60
0 17 0	21 25	17 0	10 20	4 25	20·40	8·07
0 18 0	22 50	18 0	10 80	4 50	21·60	8·55
0 19 0	23 75	19 0	11 40	4 75	22·80	9·02
1 0 0	25 0	20 0	12 0	5 0	24·	9·40
2 0 0	50 0	40 0	24 0	10 0	48·	18·80
3 0 0	75 0	60 0	36 0	15 0	72·	28·20
4 0 0	100 0	80 0	48 0	20 0	96·	37·60
5 0 0	125 0	100 0	60 0	25 0	120·	47·
6 0 0	150 0	120 0	72 0	30 0	144·	56·40
7 0 0	175 0	140 0	84 0	35 0	168·	65·80
8 0 0	200 0	160 0	96 0	40 0	192·	75·20
9 0 0	225 0	180 0	108 0	45 0	216·	84·60
10 0 0	250 0	200 0	120 0	50 0	240·	94·

FOREIGN AND COLONIAL MONEYS WITH APPROXIMATE VALUE IN BRITISH CURRENCY AT *NORMAL* RATES OF EXCHANGE

Argentine Republic.—Gold coin, 5 dollars. Silver coins, 1 dollar and 50, 20, and 10 centavos. Bronze coins, 2 and 1 centavos. Nickel coins, 20, 10 and 5 centavos. Silver dollar or peso = 4s. Money in circulation is chiefly paper, being converted at 44 cents gold to dollar = 1s. 9d. Gold dollar = 4s.

Australia.—The same as in Great Britain.

Austria-Hungary.—Gold coins, 100 krone = £4 3s. 4d.; 20 krone = 16s. 8d.; 10 krone = 8s. 4d.; Single ducat = 11 crowns 29 heller = 9s. 4¾d. Silver coin, 1 krone = 100 heller = half gulden old coinage = 10d. Exchange

about 24 krone to £. Silver gulden or florins (about 12=£)=100 kreutzer continue to be legal tender. Nickel, 20 heller=10 kreutzer of old coinage=2d., 10 heller=5 kreutzer of old coinage=1d. Bronze, 2 heller=1 kreutzer=½d., 1 heller=½ kreutzer=$\frac{1}{10}$d.

Belgium.—The same as France.

Bolivia.—100 centavos=1 boliviano (paper)=about 1s. 7d., or 12½ bolivianos to £. Coins in circulation are—silver, 50, 30, 20 and 10 centavos; nickel, 10 and 5 centavos, and English gold coin. Currency principally paper.

Brazil.—Currency paper, worth 1s. 4½d. per milreis (1,000 reis) or nearly 15 milrei=£1. Silver coinage of 2, 1 and ½ milreis pieces in circulation.

British Honduras.—100 centavos=1 dollar (gold)=4s. 1½d. British soverign (=$4.86) and half sovereign, and U.S. gold coins legal. Silver coins—5, 10, 25 and 50 cents legal tender to $10. Bronze—1 cent. legal tender to 50 cents.

Bulgaria.—Lev (=franc) = 100 stotinki=9½d. (stotinka=centime). Gold coins, 10 and 20 leva, but foreign 10 and 20 franc pieces principally in circulation. Silver, ½, 1, 2 and 5 leva. Nickel, 2½, 5, 10, 20 stotinki. Bronze, 1, 2, 5, 10 stotinki.

Canada.—1 cent=½d. 100 cents=1 dollar=about 4s. 1½d. 4 dollars 86⅔ cents=£ sterling. U.S. gold coins also legal.

Chili.—Gold coins, 20 (colon or condor), 10 (doubloon), and 5 (escudo) peso pieces. Silver coins, 1 peso and ½, $\frac{1}{10}$, and ¼ of a peso. Bronze coins, ½, 1, 2 and 2½ centavo pieces. Currency is paper—the peso or dollar=about 10d. The restoration of the gold currency is projected under a currency law which was to take effect in 1910, but has been since deferred. Gold peso=1s. 6d. English sovereign has a legal value of 13⅓ pesos gold.

China.—1,220 (about) cash=1 haikwan (or customs) tael=about 2s. 8½d. About 35 cash=1d. A coin recently issued is the "hundredth of a dollar" worth about $\frac{3}{5}$ of 1d. Silver dollar of same value as Japanese silver yen, is also current. At Hong-Kong the dollar (1,000 cash)= about 1s. 11d. and at Shanghai about 2s. 8d. In October, 1908, an Imperial Edict decreed the establishment of a uniform Tael currency—unit silver tael to have a value of between 30d. and 40d.

Cochin China.—5 sapèques or cash=1 cent; 100 cents=1 dollar=about 2s.

Colombia.—100 centavos=1 peso or dollar gold—nominal value 4s. Gold coins, 1, 2½ and 5 dollars. Silver coins, real peseta, half-dollar and dollar. Very few coins are in circulation, the currency being principally paper, subject to considerable fluctuation. At the legal rate the paper peso=1 centavo gold, or $500=£1.

Denmark.—100 Oere=1 Krone=1s. 1½d. 18 Kroner 19 Oere=£ sterling. Gold coins of 20 Kroner and 10 Kroner. Silver, 2 Kroner, 1 Krone, 25 Oere, and 10 Oere.

Egypt.—97½ piastres=£ sterling. 100 piastres, or 1,000 milliemes=£ Egyptian (gold)=£1 0s. 6½d. Gold circulating is almost exclusively English. 10 milliemes=1 piastre=about 2½d. Gold piece of 20 francs =about 77 piastres. Silver coins, 1, 2, 5, 10 and 20 piastres; legal tender to £E2.

Eritrea.—1 tallero=5 Italian lire. Silver coins, 1, 2, 5 talleros.

FRANCE.—100 centimes = 1 franc = 9½d. 20 franc piece (Louis or Napoleon) = 15s. 10d. About 25 francs 25 centimes = £ sterling. Gold coins of 5, 10, 20, 50 and 100 francs. Silver coins 20 centimes, ½, 1, 2 and 5 franc pieces. Nickel coin, 25 centimes. Bronze coins, 1, 2, 5 and 10 centimes.

GERMANY.—100 pfennig = 1 mark = about 1s. About 20·45 m. = £ sterling. Gold coins, 20 (doppel-krone), 10 (krone), and 5 (half-krone) marks. Silver coins, 1, 2, 3 and 5 marks and 50 pfennige. Thaler = 3 marks = 2s. 11d. Nickel coins, 20, 10 and 5 pfennige. Bronze coins, 1 and 2 pfennige.

GREECE.—100 lepta = 1 drachma paper = 9d. 27 drachmæ 30 lepta = £1 or about 108 drachmæ per 100 fcs. Foreign gold coins in circulation.

HOLLAND.—100 cents = 1 guilder or florin = 1s. 8d. 12 guilders 10 cents = £ sterling. Gold coins, 10 florins (16s.). Silver coins, 2½ guilders (rijksdaaler), 1 guilder, ½ guilder and 25 cents.

INDIA.—£1 = 15 rupees. 16 annas = 1 rupee = 1s. 4d. 3 pie = 1 pice, 12 pie = 1 anna = 1d. Lac of rupees = 100,000. Crore of rupees = 10,000,000.

ITALIAN SOMALILAND.—Rupia, value L. It. 1.68 (= £1/15 ster.). Silver coins, 1 rupia, ½ rupia, ¼ rupia. Bronze coins, 1 besa (value L. It. 0·0168) 2 besas, 4 besas. 1 rupia is equal to 100 besas.

ITALY.—100 centesimi = 1 lira = 9½d. About 25 lire 40 centesimi = £1 sterling. Gold coins, 100, 50, 20 and 10 lire. Silver coins, 5, 2, and 1 lira. Nickel coin, 20 centesimi. Bronze coins, 1, 2, 5 and 10 centesimi.

JAPAN.—10 rin = 1 sen = ¼d., 100 sen = 1 yen or dollar = 2s. 0½d. Gold coins 5, 10 and 20 yen. Silver coins, 10, 20 and 50 sen. Nickel coin, 5 sen. Bronze coins, 1 sen and 5 rin. The unit of account is the gold yen.

LIBYA.—The same currency as in Italy.

MEXICO.—100 centavos = 1 dollar or peso (silver) = 2s. 0½d.

NORWAY.—100 ore = 1 krone = 1s. 1½d. Gold coins, 10 and 20 kroner. Exchange 18·19 kroner = £ sterling. Paper money principally used; least value, 5 kroner. Below this amount, silver and copper coins.

PORTUGAL.—100 reis = 1 teston = 4d. 1,000 reis = 1 milreis. Paper milreis = about 4s. 1d. Gold coins, 1, 2, 5 and 10 milreis. Currency, principally paper. Conto = 1,000 milreis. In the Azores, 1 milrei = 3s. 6½d.

ROUMANIA.—1 leu = 100 bani = about 9½d. Gold coins, 5, 10 and 20 lei. Silver, 1 leu, 2 and 5 lei. Nickel, 5, 10 and 20 bani.

RUSSIA.—100 copecks = 1 rouble. Silver or paper rouble = 2s. 1½d. Gold coins—15 roubles (imperial), 10 roubles, 7·50 roubles (half-imperial), 5 roubles. 15 paper roubles = 10 roubles gold = roughly 1 guinea. Currency principally paper.

SERVIA.—Dinar = 1 franc = 9½d. Gold coins, 10 and 20 dinars. Silver, ½, 1, 2, 5 dinars. Bronze, 5 and 10 paras. Nickel, 5, 10, 20 paras.

SPAIN.—100 centimos = 1 peseta—about 26·70 pesetas to the £ sterling. Gold coins are 20, 10 and 5 peseta pieces. Silver coins, 1 and 5 pesetas.

STRAITS SETTLEMENT AND MALAY STATES.—Gold dollar = 2s. 4d. Silver coins—50, 20, 10, and 5 cent pieces—are legal tender to 2 dollars, but ½ dollar is unlimited tender. Copper coins—1, ½ and ¼ cents—are legal tender to 1 dollar.

SWEDEN.—Krona of 100 ore = 1s. 1¼d. or 18·19 kr. to the £1. Gold little used. Currency for 5 kr. or more mostly paper.

TURKEY.—40 paras = 1 piastre = 2¼d. nearly. 20 piastres = 1 medjidie. 100 piastres = 1 lira turca or gold medjidie = 18s. 109½ pias = £1. "Purse," sometimes used in accounts = 500 piastres or 5 liras and is calculated = £4 10s. 0d. Value of piastre varies in different parts of the Turkish Dominions. In Syria 1 Turkish £ = 130 local piastres and £1 = 143½ local piastres.

UNITED STATES.—1 cent = about ½d., 100 cents = 1 dollar = 4s. 1½d. 4 dols. 87 cents = £ sterling. Gold coins, 2½ dollar piece, half eagle (5 dollars), 1 eagle (10 dollars), 1 double eagle (20 dollars).

URUGUAY.—100 centavos = 1 dollar (gold) = about 4s. 3d., or $4·70 = £. Only foreign gold coins (which are legal tender) are in circulation. Silver coins, 10, 20 and 50 cents and 1 dollar. Nickel, 1, 2 and 5 cents.

VENEZUELA.—Medio = about 2½d.; real = about 5d. Monetary unit is silver bolivar = about 9½d., or 1 franc, or 25·25 bols. to the £. Exchange fluctuates slightly from the par, but 25·25 bols to the £ should be taken as a basis. Currency is based on gold standard—no paper in circulation. Coins are gold, silver and nickel, but principal coin is silver dollar of 5 bols. known as "peso fuerte" or simply "fuerte."

ATOMIC AND ELECTRONIC DATA

The radius of a hydrogen molecule is $1·2 \times 10^{-8}$ cms.

The mass of a hydrogen molecule is $3·3 \times 10^{-24}$ gms.

The average velocity of a molecule in air at 15° C. is 459 metres per second.

The mean free path of a molecule in air at atmospheric pressure is $1·42 \times 10^{-5}$ cms.; in a soft valve of typical pressure ·5 mm. the mean free path is $2·16 \times 10^{-2}$ cms.; while in a hard valve of pressure 10^{-6} mm. the mean free path is 12,500 cms.

The number of molecules per cc. at atmospheric pressure is $2·75 \times 10^{19}$; thus their average distance apart is 3×10^{-6} cms.

The number of molecules per cc. in a soft valve of pressure ·5 mm. is $1·8 \times 10^{16}$; thus their average distance apart is $3·8 \times 10^{-6}$ cms.

The number of molecules per cc. in a hard valve of pressure 10^{-6} mm. is $3·6 \times 10^{10}$; thus their average distance apart is 3×10^{-4} cms.

The negative charge on an electron is $4·774$ electrostatic units or $15·91 \times 10^{-20}$ coulombs.

The diameter of an electron is 4×10^{-13} cms.

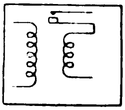
The mass of an electron is 9×10^{-28} gms.

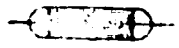
The velocity of an electron after falling through a potential drop of *V* volts is $6 \times 10^7 \sqrt{V}$ cms. per second; thus after falling through a potential of 100 volts the electronic velocity is $6 \times 10^7 \times \sqrt{100} = 6 \times 10^8$ cms. per second.

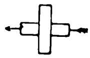
GRAPHICAL SYMBOLS FOR RADIO DIAGRAMS.

THE need for a uniform system of conventional signs for the simple interpretation of circuit diagrams used in the graphical explanation of radio apparatus has resulted in the inclusion in the report of the Committee of the British Engineering Standards Associanion, a section devoted to Radio-Communication.

Below is reproduced Section 8, *Radio-Communication of the *British Standard Graphical Symbols for Electrical Purposes.*


801. Spark Coil.


841. Coherer Detector.


842. Magnetic Detector.

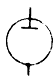

848. Incandescent[4] Lamp (Radio Symbol).

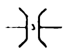

802. Arc Generator.

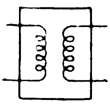

843. Crystal Detector.

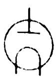

851. Spark Gap (General Symbol).

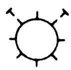

803.* Aerial (Antenna).


844. Rectifier without filament.

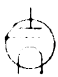

852. Quenching Spark Gap.[5]

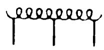

804. Air Core Transformer.[1]

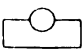

845. Thermionic Valve 2 Electrodes.

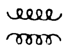

853. Rotary Spark Gap.


805. Variable Inductance (Variometer).[2]


846. Thermionic Valve 3 Electrodes.

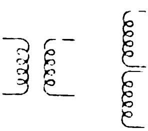

861. Direct Coupling

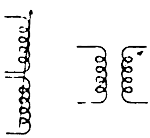

806. Decremeter.[3]


862. Inductive Coupling.


847. Thermionic Valve 4 Electrodes.


831. Telephone Receiver.


863. Fixed Air Core Mutual Inductance.[6]


864. Variable Air Core Mutual Inductance.[6] [7]

[1] If necessary, show different number of turns.
[2] When an arrow is shown, the variation is caused by change of the relative position of the coils.
[3] The circle generally has δ written inside it.
[4] The general symbol for an Incandescent Lamp is shown thus —O— (symbol 582, section 5).
[5] The figure indicates the number of gaps.
[6] Either of the two methods shown.
[7] When the angle between the axes of the two coils is zero, the mutual inductance is a maximum.
* The symbols in Section 8, dealing with Radio-communication, were prepared by a joint Committee of the Post Office, Admiralty, War Office, Royal Air Force and Marconi's Wireless Telegraph and Telephone Company, Ltd.

COMPANIES ENGAGED IN THE COMMERCIAL DEVELOPMENT OF RADIOTELEGRAPHY AND RADIOTELEPHONY

PARTICULARS OF COMPANIES ENGAGED IN THE COMMERCIAL DEVELOPMENT OF WIRELESS TELEGRAPHY & TELEPHONY

Amalgamated Wireless (Australasia), Ltd.

Incorporated.—July 11th, 1913, in the State of New South Wales.

Head Office.—"Wireless House," 97, Clarence Street, Sydney, New South Wales.

Melbourne Office.—422/4, Chancery Lane, Melbourne, Victoria.

New Zealand Office.—"Australasia Chambers," Customs House Quay, Wellington, New Zealand.

Directors.—Hon. Sir Thomas Hughes, M.L.C. (Chairman), C. P. Bartholomew, Ernest T Fisk, Alfred Gonman, James Taylor, F.C.P.A., Capt. T. Langley Webb.

Managing Director.—Ernest T. Fisk.

Assistant Manager and Secretary.—J. F. Wilson.

Accountant.—F. W. Larkins, A.I.I.A., A.C.I.S.

Factory Manager.—S. M. Grime.

Sales Manager.—V. Gardiner.

Technical Department :—Superintendent (Acting).—W. Bostock.

Marine Department :—Traffic Manager.—J. L. Mulholland. **Equipment Manager.**—D. Campbell.

Marconi School :—Manager.—A. R. Mancer.

Melbourne Branch :—Manager.—L. A. Hooke.

New Zealand Branch :—Manager.—G. Robertson.

Capital.—Authorised £200,000. Issued £160,000 in 160,000 shares of £1 each, all fully paid up. Financial year of the Company ends at June 30th. The annual general meeting is held in August.

The Company owns the sole and perpetual license to use and exploit all Marconi Patents, also all Patents for the Poulsen Pedersen and Quenched Singing Spark Systems in the Commonwealth of Australia, in the Dominion of New Zealand, and in parts of the Pacific and Indian Oceans.

It has a large organisation for manufacturing wireless telegraph apparatus, erection and operation of stations, and the system is installed on over 200 passenger and cargo ships.

The Company also controls The Wireless Press, Sydney, booksellers and publishers of "Sea, Land and Air," and the Australectric Company, Sydney, manufacturers and suppliers of Amateur Wireless and all descriptions of electrical apparatus, which Company holds a number of important and exclusive agencies.

Accounts.—The accounts are made up to June 30th in each year. The profit and loss account for the twelve months ended June 30th, 1920, shows that the gross profit from trading account, radiotelegraphic traffic, ships' subsidies, etc., amounted to £47,032 19s. 4d., and after deducting all expenses (including depreciation amounting to £5,389 2s. 5d.) there was a net profit of £8,847 10s. 5d., from which a dividend at the rate of 5 per cent. per annum was paid.

Reserve accounts at June 30th, 1920, stood at £36,314 0s. 8d. Dividends, 1913–14, 4 per cent., 1914–15, 6 per cent.; 1915–16, 5 per cent.; 1916–17, 5 per cent.; 1917–18, 5 per cent.; 1918–19, 5 per cent.; 1919–20, 5 per cent.

American Radio and Research Corporation

Incorporated.—June 15th, 1915.

Head Office.—Medford Hillside, Massachusetts.

District Offices.—21, Park Row, New York City, New York, U.S.A. 608, So. Dearborn Street, Chicago, Ill., U.S.A.

Directors.—J. Axten, Havens Grant, and H. J. Power.

Vice-President and General Manager.—Harold J. Power.

Secretary.—Havens Grant.

Capital.—$300,000.

Dividends.—Close corporation.

The Company designs and manufactures fractional horse-power motors and accessories, wireless telegraph and telephone apparatus.

Australectric Company (The)

Formed.—August, 1918.

Head Office.—97, Clarence Street, Sydney, New South Wales.

Works.—242, Kent Street, Sydney, New South Wales.

Branch Offices.—422/4, Chancery Lane, Melbourne, Victoria; "Australasia Chambers," Wellington, New Zealand.

Officers.—General Manager, Ernest T. Fisk. Assistant Manager, J. F. Wilson. Sales Manager, V. Gardiner.

The Company is owned and controlled by Amalgamated Wireless (Australasia), Ltd. It was formed for the purpose of exploiting amateur wireless apparatus manufactured by the parent concern. The operations of the Company now embrace the manufacture and sale of general electrical apparatus and accessories.

Some valuable and exclusive agencies are held by the Company, including Relay Automatic Telephones, Diamond Dry Cells, and Ozonair.

Chinese National Wireless Telegraph Company (The)

Incorporated.—Under Special Charter by virtue of an agreement dated May 24th, 1919, between the Government of the Republic of China and Marconi's Wireless Telegraph Company, Ltd.

Office.—5, Peh Ch'a Ta Fu Ssu, Peking.

Directors.—Lieut.-Gen. Ting Ching (Chairman), Rear-Admiral Chen Ngen Tao, Lin Chih Hsiu, Godfrey C. Isaacs, T. A. Barson, A. H. Ginman (Vice-Chairman and Managing Director).

Secretary.—Sohstu G. King.

Capital.—Authorised £700,000 in 700,000 shares of £1 each.

The Company was formed to manufacture, sell and maintain wireless telegraph and telephone apparatus in China, and has been granted a license by Marconi's Wireless Telegraph Company, Ltd., giving it the sole right to use in China all the Marconi Company's Patents, present and future, for wireless telegraphy and telephony.

Compagnie Radio-Maritime

Incorporated.—April 24th, 1919.

Head Office.—79, Boulevard Haussmann, Paris.

Directors.—MM. Bousquet (President), Baron de la Chevrelière (Vice-President), N. Pietri, E. Girardeau, E. Sins, Dal Piaz, Musnier, and Max Robert.

Managing Director.—M. N. Pietri.

Capital.—5,000,000 francs, divided into 50,000 shares of 100 francs each.

The Company owns and operates wireless telegraph apparatus on merchant vessels.
The Company also operates aeroplane wireless stations.

Compagnie Générale de Télégraphie Sans Fil

Incorporated.—February 5th, 1918.

Head Office.—79, Boulevard Haussmann, Paris.

Directors.—H. Bousquet (President), Baron de la Chevrelière (Vice-President), A. L. Atthalin, M. Bloch, A. Dupont, E. Girardeau, Godfrey C. Isaacs, E. May, N. Pietri, E. Sins, Paul Gauthier, L. Wibratte, Baron Jacques de Gunzburg.

Managing Director.—E. Girardeau.

Chief Engineers.—Major Brenot, Major Garnier.

Capital.—50,000,000 francs, divided into 100,000 shares of 500 francs each, subscribed and fully paid; 32,000 Parts Bénéficiaires have also been issued.
The financial year ends December 31st.

Companhia Radiotelegraphica Brasileira

Incorporated.—August 14th, 1919.

Head Office.—107, Rua 1° de Marco, Rio de Janeiro.

Directors.—Pedro A. Nolasco Pereira da Cunha, Louis Edgar Sanceau, Dr. Mario de Andrade Ramos, Señor Henrique Lage, Señor Joao Gentil de Mello Araujo, Jack Maurice, Dr. Rodrigo Octavio Filho, and Señor Roberto Cardoso.

President.—Pedro A. Nolasco Pereira da Cunha.

Managing Director.—Louis Edgar Sanceau.

Members of the Fiscal Council.—Dr. Mario de Andrade Ramos, Señor Henrique Lage, Señor Joao Gentil de Mello Araujo.

Members of the Supplementary Council.—Jack Maurice, Dr. Rodrigo Octavio Filho, Señor Roberto Cardoso.

Capital.—Rs.200:000 $000 (two hundred contos de reis) divided into 2,000 (two thousand) shares of 100$000 (hundred milreis) each.

The objects of the Company are to exploit the various patents of the Marconi Company and obtain from the Government of Brazil the necessary permission to erect high-power stations for direct communication with Europe and the United States.

Compañia Marconi de Telegrafia Sin Hilos del Rio de La Plata

Incorporated.—August 4th, 1906.

Head Office.—Calle Lavalle 544, Buenos Aires, Argentina.

Directors.—Captain Guillermo José Nunes (President), Señor Florence O'Driscoll (Managing Director), Colonel Sir Thomas Holdich, K.C.M.G., K.C.I.E., C.B., Godfrey C. Isaacs, Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., Señor Duncan Munro, Señor J. A. Pilling, Señor Carlos Fereira Pinto, Señor Enrique Schlieper, Sidney F. St. J. Steadman, Señor Antonio Terrarosa.

Secretary.—Enrique Schlieper.

Treasurer.—J. A. Pilling.

Auditor.—Herbert K. James.

Engineer.—E. Berry.

Capital.—$2,000,000 gold, represented by 250,000 shares of $5 gold each, series "AA," fully paid, and 150,000 Preference shares, 5 per cent. (non-cumulative) of $5 gold each, series "BB." 35 per cent. has been called up on the "BB" shares. The balance is payable in instalments of 10 per cent. with not less than thirty days' notice. The financial year of the Company ends on May 31st.

The Company owns the Marconi patents and patent rights for the Argentine Republic, and has licenses from Marconi's Wireless Telegraph Company, Limited, and the Marconi International Marine Communication Company, Limited, to work the Marconi system in the Republics of Argentina, Uruguay, and Paraguay. The Company has the permission of the Government to erect wireless telegraph stations within the territorial limits of the Argentine Republic and on vessels flying the Argentine flag. The Company is constructing a high-power wireless station in the Argentine Republic to communicate direct with a similar station in Europe.

Compañia Nacional de Telegrafia Sin Hilos

Incorporated.—December 24th, 1910.

Head Office.—Calle de Alcalá, 43, Madrid.

Branch Offices.—Ronda de la Universidad 35, Barcelona; Buenos Aires 13, Bilbao.

Directors.—Excmo. Sr. General Don José de Bascaran; Excmo. Sr. Senatore G. Marconi, G.C.V.O., LL.D., D.Sc.; Godfrey C. Isaacs; Excmo. Sr. Don Antonio Comyn, Conde Vo. de Albia; Excmo. Sr. Don José Sanchez Guerra; Excmo. Sr. Don Eduardo Estelat; Excmo. Sr. Don Francisco Setuain; Sr. Don Jaime Macnaughtan, Sr. Don José Asensio, and Sr. Don Manuel Moreno Quesada.

Secretary.—Sr. Don José Asensio.

Capital.—6,500,000 pesetas, divided into 8,000 6 per cent. Participating Preference shares of 500 pesetas each, and 5,000 Ordinary shares of 500 pesetas each, all issued and fully paid.

The financial year ends on December 31st.

This Company took over the concession from the Spanish Government for the construction and exploitation of a public wireless telegraph service in Spain and its colonies. The Company has ten wireless telegraph land stations erected and working at Aranjuez, near Madrid, Cadiz, Barcelona, Teneriffe, Las Palmas, Vigo, Soller, Finisterre, Santander, and Cape Palos, and has further stations in course of construction. The Company holds an exclusive license from Marconi's Wireless Telegraph Company, Limited, to use and exploit its patents in Spain and her colonies.

The Company has established a direct wireless telegraph service between Spain and England, and also conducts services with Germany via Barcelona and Nauen; Austria via Barcelona and Deutsch-Altenburg; Hungary via Barcelona and Budapest; France via Sainte Assise; and Italy via Barcelona and Centocelle (Rome).

Compagnie Radio-France

Head Office.—Paris, 79, Boulevard Haussmann.

Directors.—Jules Cambon (President), Henri Bousquet, Emile Girardeau, Nicolas Pietri, Louis Wibratte, Marcel Bloch, Jules Carpentier, Baron de la Chevrelière, Andre Dupont, O. Gauthier André Laurent-Atthalin, Ernest May, Henri-Valentin Mehu.

Capital.—Frs. 60,000,000.

The Company supply material and apparatus and erect wireless stations of any power for telegraphic or telephonic communication.

Drahtloser Übersee-Verkehr A.G. (Transradio)

Founded.—1918.

Head Office.—Berlin S.W.11, Hallesches-Ufer 12/13.

Founded by the Allgemeine Elektricitätsgesellschaft, Siemens & Halske A.G. and the Gesellschaft für drahtlose Telegraphie m.b.H. (Telefunken), Berlin. The Company was formed to exploit installations for wireless telegraphy and telephony in Germany and other countries.

Directors.—Frits Ulfers, Karl Solff, Otto Betz (Vice-Director).

The Company has substantial interests in the Transradio, Compania Radiotelegrafica Argentina S.A., Buenos Aires.

Federal Telegraph Company (The)

Incorporated.—In the State of California, in 1911.

Offices.—Hobart Building, San Francisco, California, and 400, Homer Building, Washington D.C.

Factory.—Palo Alto, California.

Directors.—R. P. Schwerin, Leon Bocqueras, Hiram W. Johnson, Jun., Alexander Hamilton and B. E. Alanson.

President.—R. P. Schwerin.

Vice-President.—Leon Bocqueras.

Secretary.—Augustus Taylor.

Treasurer.—J. E. Godcharles.

Capital.—\$2,500,000°°; 250,000 shares, par value each \$10°°.

The Company was formed for the operation of wireless telegraphy and the manufacture of the Poulsen Arc and other wireless sets.

Gesellschaft für Drahtlose Telegraphie m.b.H. (Telefunken)

Incorporated.—June 15th, 1903.

Head Office.—Hallesches Ufer 12/13, Berlin, S.W.11.

Directors.—Count von Arco, Dr. ing. C. Schapira, Fritz Ulfers, Karl Solff (Vice-Director).

Founded by the Allgemeine Elektritititäts-Gesellschaft, Berlin, and Siemens and Halske A.G., Berlin, for the exploitation of the patents of Professor Slaby, Professor Braun, and Count von Arco all over the world.

The Company, whose shares are in the sole possession of the Allgemeine Elektrititäts Gesellschaft and Siemens and Halske, Berlin, is interested in the following companies:—

- Det Norske Radioselskap (System Teunken), Kristiania.
- Deutsche Betriebsgesellschaft für drahtlose Telegrafie m.b.H., Berlin (Debeg).
- Deutsche Ubersee-Gesellschaft für drahtlose Telegrafie A.-G., Berlin.
- Drahtloser Ubersee-Verkehr, A.-G., Berlin (Transradio).
- Ellvesa G.m.b.H., Berlin.
- Société Anonyme Internationale de Télégraphie sans Fil, Brussels.
- Società Radioelettria Italiana, Rome.
- Svenska Aktiebolaget Tradloes Telegrafi, Stockholm.
- Telefunken-Marconi, Code A.-G., Berlin.
- Telefunken, Ostasiatische Gesellschaft für drahtlose Telegraphie m.b.H., Shanghai.
- Transradio Compañia Radiotelegráfica Argentina S.A., Buenos Aires.

Independent Wireless Telegraph Company, Inc.

Incorporated.—February 12th, 1919, in the State of Delaware, U.S.A.

Head Office.—42, Broadway, New York City, New York, U.S.A.

European Office.—7, Hobart Place, London, S.W.1, England.

Factory.—Port Chester, New York, U.S.A.

Directors.—P. R. Mallory, C. J. Pannill, C. D. Mallory, and Frank C. Munsen.

President.—P. R. Mallory.

Vice-President and General Manager.—C. J. Pannill.

Treasurer.—F. H. Seeley.

European Superintendent.—D. J. Heilig.

Capital and Dividends.—Close Corporation.

The Company was formed for the operation of wireless telegraphy and the manufacture of wireless telegraph apparatus.

Marconi International Marine Communication Company, Limited (The)

Incorporated.—April 25th, 1900.

Head Office.—Marconi House, Strand, London, W.C.2.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc. (Chairman), Godfrey C. Isaacs (Deputy Chairman and Managing Director), Alfonso Marconi, Capt. H. Riall Sankey, C.B., C.B.E., R.E. (retired), Henry W. Allen, F.C.I.S., W. W. Bradfield, C.B.E., M. A. Bramston, S. F. St. J. Steadman, Sir Charles J. Stewart, K.B.E., Rt. Hon. Lord Herschell, G.C.V.O., and Lt.-Col. A. Simpson, C.M.G., R.E. (retired).

Joint General Managers.—W. W. Bradfield, C.B.E., Henry W. Allen, F.C.I.S., and Lt.-Col. A. Simpson, C.M.G.

Assistant General Managers.—G. E. Turnbull and H. W. Corby, F.C.I.S.

Secretary.—A. Ogle, M.C., A.C.I.S.

Marine Superintendent.—Capt. C. V. Daly.

Traffic Manager.—

Contract Manager.—A. R. Harding.

Technical Manager.—Commander J. A. Slee, C.B.E., R.N.

Capital.—£1,500,000 in shares of £1 each, issued and fully paid £1,192,726. (The capital was increased in May, 1919, by 900,000 shares of £1 each, of which 600,000 were offered to existing shareholders pro rata at par.) 5½ per cent. First Mortgage debentures (bearer)—authorised £250,000, issued £125,000, outstanding £68,100. Secured (without trust deed) as a floating charge on the undertaking and all the property. Redeemable at par, July 1st, 1941. Interest payable, January 1st and July 1st.

Accounts and Dividends.—Accounts are made up to December 31st and usually submitted in June following. The accounts at December 31st, 1920, showed, after deduction of £54,000 paid on account of Excess Profits Duty, a profit of £225,461, which included the amount brought forward. After payment of dividend £46,552 was carried forward subject to Excess Profits Duty for years 1916 to 1920 inclusive, less amount paid on account, and Corporation Profits Tax for 1920.

Dividends paid, 1910, 5 per cent.; 1911, 7 per cent.; 1912, 1913 and 1914, 10 per cent.; 1915, 12½ per cent.; 1916, 1917, 1918, 1919 and 1920, 15 per cent.

Last Bearer Coupon paid, No. 19.

This Company was formed for the purpose of working throughout the world, except in the United States of America, Hawaii, Chili, and colonies or dependencies of those States, an exclusive license for all maritime (being mercantile or yachting) purposes granted by Marconi's Wireless Telegraph Company, Limited. The Company has transferred to Associated Companies its rights in Canada, Argentina, Uruguay, Australasia, and all European countries and their dependencies except the United Kingdom and Italy. This Company owns and operates the wireless telegraph apparatus on over 3,000 vessels of the mercantile marine.

Marconi Scientific Instrument Company, Limited (The)

Incorporated.—November 1st, 1919.

Registered Office and Works.—21/25, St. Anne's Court, Dean Street, Soho, London, W.1.

Directors.—William W. Drury (Managing Director), Henry W. Allen, F.C.I.S., W. W. Bradfield, C.B.E., C. Mitchell, Chas. B. Ward.

Secretary.—Arthur J. Wheeler, A.C.I.S.

Capital.—Authorised £20,000 in 20,000 shares of £1 each.

The Company was formed to manufacture and sell amateur wireless telegraphic and telephonic apparatus under license from Marconi's Wireless Telegraph Company, Limited. Also to manufacture and market all classes of land-line and submarine cable apparatus.

"Marconi" Societate Anonima Românâ Pentru Industria Si Comertul de Materiale Telegrafice, Telefonice Si Electrice

Incorporated.—April 5th, 1920.

Amalgamated with "Radioelectrica" Societate Anonimâ Românâ pentru industria si comertul materialelor telegrafice si telefonice, with effect from October 27th, 1921.

Present Name.—"Radioromana" Societate Anonimâ Românâ pentru industria si comertul materialelor telegrafice si telefonice.

Address of Head Office.—4, Strada Saguna, Bucharest.

Directors.—Prince Barbu Stirbey (President), C. P. Olânescu (Vice-President), N. Vasilescu-Karpen, Godfrey Isaacs, Colonel J. E. Cochrane, D.S.O., Alex. Tzigara-Samurcas, Capt. Edwin Boxshall, C. D. Busilâ, Cezar Boerescu, D. Leonida, Emile Girardeau, Paul Mangard.

Managing Directors.—C. Busilâ, Colonel J. E. Cochrane, D.S.O., Paul Mangard.

General Manager.—Eugen Craioveanu.

Secretary.—Major A. A. O'Kelly.

Capital.—12,000,000 lei. 24,000 fully paid-up shares of 500 lei each.

The Company was formed for the manufacture, supply and installation of all kinds of telegraphic and telephonic apparatus, including wireless.

Marconi Wireless Telegraph Company of Canada, Limited (The)

Head Office.—Marconi Building, 9-11-13, Saint Sacrament Street, Montreal, Canada.

President.—A. E. Dyment.

Vice-Presidents.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., Robert Bickerdike.

Directors.—Sir William Mackenzie, Godfrey C. Isaacs, G. M. Bosworth, C. G. Greenshields, K.C.

Managing Director.—A. H. Morse, A.M.I.E.E. (London), Member I.R.E. (New York).

Manager.—A. L. W. MacCallum.

Comptroller and Acting Secretary.—J. P. Fleming.

Traffic Manager. —G. H. Pearson, Assoc.I.R.E. (New York).

Chief Engineer. —J. O. G. Cann, M.I.(A.)E.E., Fellow I.R.E. (New York).

Authorised Capital.— $7,500,000 in 3,000,000 shares of $2.50 each.

Issued Capital.—2,200,000 shares.

The Company has sole wireless rights under all Marconi and General Electric Company patents in the Dominions of Canada and Newfoundland. It is the only Company in Canada manufacturing wireless apparatus and providing wireless service. It owns and operates the wireless equipment on over two hundred ships of the Canadian and Newfoundland Mercantile Marines, and also owns and operates the duplex, transatlantic, commercial wireless telegraph station at Glace Bay in Nova Scotia.

The Company operates under contract with the Canadian and Newfoundland Governments, about forty wireless stations in the Great Lakes, Gulf of St. Lawrence, and on the Atlantic Coast. It has branch offices in Vancouver, B.C., Toronto, Ont., St. John, N.B. (winter), and St. John's (Nfld.). It owns and operates schools of radiotelegraphy in Montreal, Toronto, and St. John's Nfld.).

Marconi's Wireless Telegraph Company, Limited

Incorporated.—July 20th, 1897, as "Wireless Telegraph and Signal Co., Ltd."; name changed as above in March, 1900.

Head Office.—Marconi House, Strand, London, W.C.2.

Works.—Chelmsford, Essex.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc. (Chairman), Godfrey C. Isaacs (Deputy-Chairman and Managing Director), Captain H. Riall Sankey, C.B., C.B.E., R.E. (retired), Alfonso Marconi, W. W. Bradfield, C.B.E., Henry W. Allen, F.C.I.S., M. A. Bramston, S. F. St. J. Steadman, Sir Charles J. Stewart, K.B.E., Rt. Hon. Lord Herschell, G.C.V.O., and Lt.-Col. Adrian Simpson, C.M.G., R.E. (retired).

Joint General Managers.—W. W. Bradfield, C.B.E., Henry W. Allen, F.C.I.S., and Lt.-Col. Adrian Simpson, C.M.G., R.E. (retired).

Assistant General Managers.—G. E. Turnbull and H. W. Corby, F.C.I.S.

Secretary.—A. Ogle, M.C., A.C.I.S.

Chief Engineer.—Andrew Gray, M.I.E.E., A.M.Inst.C.E.

The Company was formed to acquire Senatore Marconi's patents for wireless telegraphy in all countries except Italy, its colonies and dependencies, and has since acquired a large number of other patents relating to wireless telegraphy, including those of Sir Oliver Lodge, the General Electric Company of New York (except for America), etc.

It has substantial interests in various subsidiary and affiliated Companies.

The Company conducts public wireless telegraph services, and messages are accepted for transmission, via Marconi, to the United States of America, Canada, Australia, New Zealand, the West Indies, British Guiana, British Honduras, Spain, France, Switzerland, etc.

Accounts and Dividends.—Accounts are made up to December 31st, and usually submitted in June following. The Company's accounts at December 31st, 1920, showed shares in Associated Companies and Patents, £2,941,517 (par value of shares, £3,488,847), and General Reserve Account £4,001,368. The profit for the year, together with the balance brought forward, was £1,242,134, and after payment of dividends, £820,567 was carried forward.

In respect of each of the years 1911, 1912 and 1913, the Company paid dividends of 17 per cent. on the Preference shares and 20 per cent. on the Ordinary shares; in respect of 1914 and 1915, 7 per cent. Preference and 10 per cent. Ordinary dividends were paid; in respect of 1916 the dividends were 12 per cent. on the Preference shares and 15 per cent. on the Ordinary shares; in respect of 1917 the dividends were 17 per cent. on Preference shares and 20 per cent. on the Ordinary shares. For 1918 dividends of 22 per cent. on the Preference shares and 25 per cent. on the Ordinary shares were paid. For 1919 dividends of 22 per cent. on the Preference shares and 25 per cent. on the Ordinary shares were paid, plus a bonus of 5s. per share on both Preference and Ordinary shares. For 1920, dividends of 12% on the Preference shares and 15% on the Ordinary shares were paid.
(Last Bearer Coupons paid: No. 21 Preference, No. 20 Ordinary.)

Capital.—Authorised £3,000,000 in 2,750,000 Ordinary shares of £1 each, and 250,000 Cumulative Participating Preference shares of £1 each. The Preference shares are entitled to a cumulative dividend of 7 per cent., and, after the Ordinary shares have received a 10 per cent. non-cumulative dividend, to share *pari passu* with the latter shares in surplus profits remaining. Issued (October, 1921) 250,000 Preference shares and 2,636,906 Ordinary shares. In November, 1919, the authorised capital was increased by the creation of 1,500,000 Ordinary shares, which were offered in December 1919, to existing shareholders *pro rata* at a premium of £2 per share.

Nederlandsche Seintoestellen Fabriek

Incorporated.—February 27th, 1918.

Head Office and Works.—Jan v. d. Heydenstraat, Hilversum, Holland.

Directors.—Bern E. Ruys (President), D. Hudig L. Jzn (Commissaire Délégué), A. J. M. Goudriaan, J. H. Hummel, A. E. J. Bertling, A. Veder, G. C. Isaacs, G. E. Turnbull, J. Rypperda Wierdsma.

Manager.—A. Dubois.

Capital.—2,000,000 florins, divided into 2,000 shares of 1,000 florins each.

The financial year ends December 31st.

The Company was formed for the purpose of exploiting a factory or factories for the manufacture of installations, apparatus and tools destined for or relating to wireless telegraphy, telephony, signalling apparatus, etc., and trading in the above-mentioned apparatus. It has entered into an agreement with Marconi's Wireless Telegraph Company, Limited, whereby the latter Company grants to the N.S.F. the exclusive right to manufacture and sell in Holland and the Dutch Colonies wireless material according to its Patents and designs, present and future.

Nederlandsche Telegraaf Maatschappij, "Radio-Holland"

Incorporated.—December 6th, 1916.

Head Office.—562 Keizersgracht, Amsterdam.

Directors.—D. Hudig L. Jzn (President), J. Rypperda Wierdsma, A. J. M. Goudriaan, J. Wilmink, P. J. Roosegaarde Bisschop, H. Colyn, Prof. C. L. van der Bilt, J. E. van Hengel, Senatore G. Marconi, Godfrey C. Isaacs, Maurice Travailleur, Gaston Périer.

Managing Directors.—L. H. F. Waekers and Th. P. van der Bergh.

Administrator, Dutch East Indies.—W. A. J. Liebert.

Capital.—3,000,000 florins, divided into 3,000 shares of 1,000 florins each, of which 2,000 shares have been issued and fully paid.

The financial year ends at December 31st.

The Company was formed for the purpose of the establishment, sale, hire, control and exploitation of wireless telegraph and wireless telephone stations in Holland and its colonies.

Norsk Marconikompani Aktieselskap

Constituted.—November 28th, 1918.

Head Office.—Karl Johansgate 5, Kristiania.

Branch Office.—Nygaardsgaten 13, Bergen.

Capital.—1,250,000 Kroner, divided into 1,250 registered shares of Kroner 1,000 each.

Directors.—Consul-General O. J. Storm, C.B.E. (Chairman), Commander J. Bull, Godfrey C. Isaacs, Commander B. L. Gottwaldt, E. S. Skottun, Otto Thoresen, and Maurice Travailleur.

Deputy Directors.—A. Hubert, G. B. Turnbull, and K. Zimmer.

Managing Director.—O. J. Storm, C.B.E.

Deputy Managing Director.—E. S. Skottun.

Manager.—B. L. Gottwaldt.

This Company was constituted for the manufacture, sale, and rental of apparatus for Wireless Telegraphy, Telephony, Signalling, etc., and other business in connection therewith. It has acquired the Marconi patent rights, present and future, for exploitation in Norway and on board ships flying the Norwegian flag.

Pan-American Wireless Telegraph and Telephone Company (The)

Incorporated.—State of Delaware, U.S.A. Amended Certificate of Incorporation, October 18th, 1917.

Offices.—233, Broadway, New York City.

Directors.—Hon. John W. Griggs, Edward J. Nally, James R. Sheffield, David Sarnoff, Edward W. Harden, Albert G. Davis, C. B. Coady, R. Mainzer, R. P. Schwerin.

Chairman.—Hon. J. W. Griggs.

President and General Manager.—Edward J. Nally.

Vice-President and Commercial Manager.—David Sarnoff.

Vice-President.—Powhatan Page.

Secretary.—Charles J. Ross.

Treasurer.—George S. De Sousa.

Assistant Secretary and Assistant Treasurer.—L. MacConnach.

Capital.—3,500 shares 7 per cent. preferred stock of $100 each, cumulative after January 1st, 1921; 50,000 shares common stock, no par value. The financial year ends December 31st.

The Company has the exclusive right and license to use the Marconi and Poulsen Patents for the sole purpose of radio or wireless communication between the United States of America and all countries of South America, Central America, Mexico, the Islands of Cuba, Porto Rico, and the West Indies.

Radio Communication Company, Limited

Incorporated.—March 14th, 1919.

Head Office.—34/35, Norfolk Street, London, W.C.2.

Directors.—T. W. Stratford-Andrews (Chairman), Sir Wm. R. Brooke, K.C.I.E., J. Herbert Scrutton, B. Binyon, O.B.E. (Managing Director).

General Manager.—A. B. Snoaden.

Secretary.—W. H. C. Rowe, C.B.E.

Capital.—£200,000, divided into 100,000 6 per cent. Cumulative Participating Preference shares and 100,000 Ordinary shares. Issued: 79,502 Ordinary and 81,650 Preference.

The Company was formed under the ægis of the Indo-European Telegraph Company, Limited, for the manufacture, sale and operation of radio apparatus, including "Polar" radio equipment for ships.

Radio Corporation of America

Incorporated.—October 17th, 1919, in the State of Delaware.

New York Office.—Woolworth Building, 233, Broadway, New York City.

Directors.—Owen D. Young (Chairman), E. J. Nally (President), E. W. Rice, Jun., Hon. John W. Griggs (General Counsel), James R. Sheffield, A. G. Davis, Gordon Abbott, Edward W. Harden F. A. Stevenson, W. S. Gifford, and George S. Davis.

Secretary. John W. Elwood.

Assistant Secretary.—L. MacConnach.

Comptroller.—Charles J. Ross.

Treasurer.—George S. de Sousa.

Assistant Treasurer.—M. H. Payne.

Capital.—Authorised: $25,000,000 Preferred Stock in 5,000,000 shares of $5 each. There are also 7,500,000 Common shares of no par value. Issued: $14,023,670 in 2,804,734 Preferred shares of $5 each, fully paid. 5,580,760 Common shares of no par value. Rights: The Preferred Stock is entitled to receive dividends of 7 per cent. per annum and no more. In any distribution of the assets it is entitled to be paid off at par, prior to any payment to the Common shareholders. The Preferred dividends are cumulative after the fiscal year ending in or with the calendar year 1923, and the Preferred Stock may be retired on any day on which a dividend thereon shall be payable, at $5.50 per share and accrued dividends.

The Company was formed to acquire certain assets of The Marconi Wireless Telegraph Company of America and all wireless inventions, present and future, of the General Electric Company of New York.

R.M. Radio Limited

Registered.—September 6th, 1919.

Head Office and Engineers' Offices and Show-rooms.—5, Regent Square, Gray's Inn Road W.C.1.

Directors.—H. K. Rivers Moore, W. H. Merriman, L. J. Graham, A. G. Ionides, C. N. Rivers Moore.

Secretary.—W. H. Merriman.

Capital.—£10,000.

The Company was formed for the purpose of constructing, supplying, maintaining and operating radiotelegraphic and telephonic apparatus of all kinds for the purpose of intercommunication on land, at sea, and in the air.

Russian Company of Wireless Telegraphs and Telephones (The)

Incorporated.—October 8th, 1908.

Head Office.—14, Lopouchinskaja, Petrograd, Russia.

Directors.—Senatore G. Marconi, G.C.V.O., LL.D., D.Sc., G. C. Isaacs, S. M. Eisenstein, Pierre de Balinski, M. Salberg, Lt.-Col. Adrian Simpson, C.M.G., R.E. (Managing Director), Admiral I. F. Bostrem, I.R.N. (retired), L. M. Eisenstein (Deputy Director).

Secretary.—Leon Eisenstein.

Capital.—Originally 1,200,000 roubles in 12,000 shares of 100 roubles each. This capital was increased to 1,800,000 roubles in November, 1911, in order to enable the Company to acquire a license from Marconi's Wireless Telegraph Company, Limited. The capital was further increased in 1913 to 2,400,000 roubles, and in 1914 to 3,000,000 roubles, divided into 30,000 shares of 100 roubles each.

The financial year ends December 31st (Russian date).

Dividends.—In respect of the years 1912 and 1913 dividends of 6 per cent. have been paid and 15 per cent. in respect of 1914 and 1915, and 17 per cent. for 1916.

The Company owns the Russian patents taken out in the name of S. M. Eisenstein, and also holds an exclusive license to use and exploit the Marconi Company's patents in Russia (excluding stations for international communication or on vessels of Russian Mercantile Marine).

(N.B.—Owing to the political situation in Russia it has not been possible to revise the particulars concerning the above Company.)

Societa' Anonima Fiumana per le Radio Comunicazioni

Chairman.—Senatore Guglielmo Marconi.

Managing Director.—Marquis Luigi Solari.

Directors.—Ing. Giovanni Rubinich, Prof. Arturo De Meichsner.

Censeurs.—Avv. Ernesto Franchi, Sig. Giovanni Santini, Sig. Giulio Bresci, Sig. Annibale Ploech.

Capital.—L150,000—(Authorised L1,500,000).

Societa' Italiana Dei Servizi Radiotelegrafici e Radiotelefonici

Head Office.—Corso Umberto 1, 271, Rome.

Chairman.—Senatore Guglielmo Marconi.

Managing Director.—Marquis Luigi Solari.

Directors.—Senatore Angelo Salmoiraghi, Senatore Ernesto Presbitero, Generale Maurizio Mario Moris.

Censeurs.—Comm. Cesare Cazzulini, Comm. Francesco Pages, Mr. Arthur Cappelaere.

Joint Censeurs.—Ragioniere Mario Fogliani, Avv. Michele Di Rienzo.

Capital.—L1,000,000—(Authorised L10,000,000).

Société Anonyme Internationale de Télégraphie Sans Fil

Incorporated.—March 31st, 1913.

Head Office.—13, Rue Bréderode, Brussels.

Capital.—4,500,000 francs, divided into 9,000 shares of 500 francs each, all issued and fully paid.

The last dividend paid was 20 per cent. for the year 1920.

The financial year ends at December 31st.

The Company exploits wireless telegraphy on vessels of the mercantile marine of all European countries excepting the United Kingdom of Great Britain and Ireland, Germany, Austria-Hungary, Italy and France, and at the present time owns and operates wireless telegraph apparatus on nearly 600 vessels.

Société Française Radio-Electrique, Société Anonyme

Incorporated.—April 4th, 1910.

Head Office.—79, Boulevard Haussmann, Paris.

Laboratory.—Suresnes (Seine), 51, Rue Carnot.

Works.—Levallois-Perret (Seine), 2, Quai Michelet.

Big Machine Works.—Belfort: Société Alsacienne de Constructions Mécaniques.

Tower and Pillar Works.—Venissieux (Rhône), 72, Chemin du Moulin à Vent à Parilly.

Chairman.—M. Henri Bousquet.

Vice-Chairman.—M. G. Ferrand.

Financial Directeur.—M. A. Fondère.

Managing Director.—M. E. Girardeau.

Directors.—Comte de Beaumont, Baron de La Chevrelière, P. Desachy, A. Dupont, N. Pietri, O. de Rivaud.

Technical Manager.—Major P. Brenot.

Technical Advisers.—MM. Bethenod, Latour, Boucherot, de Bellescize, Petit.

Capital.—7,000,000 francs, divided into 70,000 shares of 100 francs each, all issued and paid up.

The Company manufactures wireless telegraph apparatus and engines, and erects wireless stations, and also owns and operates the patents of MM. J. Bethenod, E. Girardeau, M. Latour, etc.

It exploits chiefly that system of wireless telegraphy which employs high-frequency machines, the system adopted for all the great stations of France and its Colonies and by various other Governments.

Société Independante Belge de Telegraphie Sans Fil, Société Anonyme

Incorporated.—January 29th, 1920.

Head Office.—23, Boulevard de Waterloo, Brussels.

Directors.—M. le Baron Henri Lambert (President), MM. Braillard (Managing Director), De Formanoir Vanderhaeghen, Van Halteren.

Manager.—M. Jamotte.

Capital.—1,000,000 francs, divided into 2,000 shares of 500 francs each.

Société Indépendante de Télégraphie sans Fil

Head Office.—66, Rue la Boëtie, Paris.

Works and Laboratory.—Malakoff 76 Route de Châtillon.

Administrators.—M. M. Boé (Président), F. Bézerie, Chéronnet, Maurice, E. Wormser.

Managers.—Mr. R. Braillard (technical); Mr. J. Hubert (commercial).

Technical Advisers.—M. le Docteur L. Brillouin, M. M. R. Barthelemy, G. Beauvais, M. Guéritot, Laut, Poncet.

Capital.—1,500,000 francs, divided into 3,000 shares of 500 francs each, issued and fully paid.

The Company manufactures wireless telegraph and telephonic apparatus, including valves, and constructs and maintains wireless stations, both land and ship. The Company operates the patents of MM. Bardeloni, R. Barthelemy, G. Beauvais, R. Braillard, L. Brillouin, R. B. Goldschmidt M. Guéritot, P. J. Laüt, Pellin, Pelletier, etc.

Wireless Speciality Apparatus Company

Incorporated.—June 14th, 1907, New York.

Head Office.—131, State Street, Boston.

Directors.—George S. Davis, William Newsome, Eugene W. Ong, C. B. Davis, R. H. Rice, E. P. Edwards.

President.—George S. Davis.

Vice-President.—William Newsome.

Secretary.—John L. Warren.

Treasurer.—E. C. Porter.

General Manager.—T. Johnson, Jr.

Chief Engineer.—William H. Priess.

Consulting Engineer.—Professor Greenleaf W. Pickard.

Capital.—$192,000.

The fiscal year ends December 31st of each year.

The Company is engaged in the development and manufacture of radio apparatus and devices, and of "Faradon" condensers for both high and low tension work, including condensers of special design for continuous wave radio apparatus.

BIOGRAPHICAL SECTION

(A) Biographies.

(B) Obituary Notices.

BIOGRAPHICAL NOTICES

Abraham, Henri.—General Secretary of the Société Française de Physique, 1901 to 1913, now Professor of Physics at the Sorbonne in Paris.

Adalsteinsson, F.—Born at Akureyri, Iceland, December 30th, 1890. Since 1908 engaged in the Iceland Government Telegraph Service. Studied wireless telegraphy in Norway and Denmark in 1916 and 1917. Since February, 1917, Superintendent of Reykjavik Wireless Station and School. Supervised erection of four wireless coast stations in Iceland. Inspector of wireless installations in that country. Address, Loftskeytastodin, Reykjavik, Iceland.

Alexanderson, Ernst Fredrik Werner.—Chief Engineer, Radio Corporation of America. B. Upsala, Sweden, January 25th, 1878. Educ, at the High School and University of Lund. Sweden, and at the Royal Institute of Technology, Stockholm, completing a post-graduate course at Berlin. Entered the service of the C. and O. Electric Company, 1901. Joined the General Electric Company, 1902. Occupies the post of consulting engineer to the latter concern. Introduced iron into the manufacture of high frequency circuits, and originated the development of 2, 50 and 200 kw. radio frequency alternators and the magnetic amplifier. The first 200 kw. radio frequency alternator and magnetic amplifier for radiotelegraphic work designed by Mr. Alexanderson was installed in the Marconi Company's station at New Brunswick, N.J., and has now been adopted by the Radio Corporation of America for all of its high power stations. Also developed the "barrage" receiver and kindred inventions. Has carried on notable pioneer work in duplex radio telephony. Holds a number of United States patents. Member of the American Institute of Electrical Engineers. Fellow and President of the Institute of Radio Engineers. Author of over twenty scientific papers read before various technical societies. Address : Woolworth Building, New York.

Allen, Henry W., F.C.I.S. (1902), Joint General Manager, Marconi's Wireless Telegraph Company, Ltd., and Marconi International Marine Communication Company, Ltd. (1910). B. 1870. Met Senatore Marconi, 1896. Assisted (1897) in formation of the Wireless Telegraph and Signal Co., Ltd., afterwards becoming secretary to that company. Secretary of Marconi International Marine Communication Co., Ltd., and Assistant Manager of Marconi's Wireless Telegraph Co., Ltd. (1900). Deputy Manager, Marconi's Wireless Telegraph Co., Ltd. (1910). Elected to a seat on the Board of each company, 1917.

Appleby, Thomas.—B. May 10th, 1886, near Newcastle-on-Tyne, England. Arrived in America, 1888. Commenced wireless experiments, 1899. Went to sea, 1909, as radio operator. September, 1909, in charge of United Wireless Station at Atlantic City, N.J. April, 1912, in charge of Wanamaker-Marconi Service between New York and Philadelphia Wanamaker Stores. April 9th, 1917, commissioned in the U.S. Navy as a Lieutenant (J.G.) for Radio Engineering. Ordered to the Office of the Director of Naval Communications, Navy Department, Washington, D.C. Author of U.S. "Wartime Radio Instructions for Merchant Vessels." Spring of 1918, established shore radio compass stations for the detection and location of enemy vessels in West Atlantic. Selected the sites and supervised the erection, installation and calibration of shore radio compass stations erected on Atlantic coast of United States from Cross Island, Maine, to Gulf of Mexico. Spring of 1919, selected sites for shore radio compass stations on the Pacific Coast of the United States. April 24th, 1919, promoted Senior Lieutenant, U.S. Navy. August 7th, 1919, released from active duty, U.S. Navy. August 8th, 1919, Radio Engineer in the Office of the Director of Naval Communications and given entire charge of all shore radio compass stations in the United States. November 15th, 1919, resigned from Navy Department to enter profession of Patent Lawyer. Full Member of the Institute of Radio Engineers, New York. Address: 5847, Ellsworth Street, Philadelphia, Pa., U.S.A.

Appleton, Edward Victor, M.A. (Cantab.), M.Sc. (Lond.), Fellow of St. John's College, Cambridge. B. Bradford, 1892. Educ. St. John's College, Cambridge. First-class Honours in National Science Tripos, Parts I. and II. (Physics). Served European War, 1914-1919, as Captain W/T, R.E. Specially interested in Thermionic Valves. Engaged in Valve Research, Cavendish Laboratory, Cambridge. Member of Thermionic Valve Sub-Committee, Radio Research Board, Department of Scientific and Industrial Research. Address: St. John's College, Cambridge.

Arco, Graf Georg von.—B. Grossgorschütz, Hersklesien. Educ. at Berlin University and Technical High School, Charlottenburg. Assistant to the late Professor Slaby in the department of wireless telegraphy, 1898; later joined the Allgemeine Elektrizitäts Gesellschaft, Berlin, continuing at the same time his work on the Slaby-Arco system of wireless telegraphy. Manager of the Gesellschaft fur Drahtlose Telegraphie, 1903. Carried out practical wireless telephony over a distance of 35 km. (21.7 miles), 1906. Exhibited high frequency alternator with static frequency step-up transformers at the International Radiotelegraph Congress in London, 1912. This arrangement is now used in the high power-station of Nauen, generating 400 kw. in the aerial and used for telegraphy and telephony. Address: Tempelhof, Berlin, Albrechtstrasse 49/50.

Armstrong, Edwin H., Professor at Columbia University and President of the Radio Club of America. B. in U.S.A., December 18th, 1890. Graduated at Columbia University in 1913. Has undertaken radiotelegraphic work in conjunction with Professor Pupin at the Columbia Laboratories. He is himself a director of the Institute of Radio Engineers, and was recently awarded the medal of the Institute. Served two years in A.E.F. as Captain and Major in the Signal Corps. Decoration: Chevalier

Légion d'Honneur. Address: Columbia University, New York City.

Asano, Dr. Osuke.—B. 1859. Graduated at the Engineering College of the Tokyo Imperial University, 1881. Honorary Professor, Tokyo University. Director of the Electro-Technical Laboratory of the Department of Communications, 1897. Retired, 1919. Took many trips to Europe and America, first for the investigation of electrical engineering; second as a Japanese delegate of the International Wireless Telegraph Conference, Berlin, 1906; and third as a Japanese delegate of the International Conference on Electrical Units and Standards, London, 1908. Pioneer of wireless investigation in Japan, and his investigation has continued since 1897. The so-called "Telshinsho" wireless system is due to his investigations. Laid the submarine cable between Formosa and Osumi in 1895-97, the first long-distance submarine cable ever laid by a Japanese. Raised to the rank of Dr. Engineer, 1899. Supervises all electrical works in Japan. Awarded 2nd Order of Merit, 1914. Address: 148, Kogaicho, Azabu, Tokyo.

Asin, Don Humberto de, Engineer-in-Chief of the Radiotelegraph Service of Bolivia. Studied electricity at the University of Santiago. Chief of important technical sections, railways of Guaqui y Arica at La Paz. Studied radiotelegraphy. Visited San Cristobal, Lima, the School of Santiago, and the two installations which were then at the Docks, Buenos Aires. Commissioned by Bolivian Government to visit Europe. Graduated as radiotelegraphist at the Marconi Company's professional school at Broomfield. Visited Germany to study the Telefunken system. Installed six stations in Bolivia and Trinidad, Cobija. Villa Bella, Concepcion, Magdalena, San Ignacio, Puerto Suárez, Santa Cruz, Todos Santos and many more.

Athanasiadis, Capt. C.—B. Athens, 1878. Educ. Royal Naval College, 1892. Commissioned in the Navy, 1896, and after eleven years' active service became interested in wireless telegraphy. Supervised the erection of the first wireless installations in Greece. Sent to London, 1909, by his Government as the head of a mission for the construction of Greek wireless stations. Remained in England for a year and a half, and during that period came into close contact with the Marconi organisation. On his return to Greece he was appointed head of the Radiotelegraph Service of the Navy. In November, 1920, he resigned his commission in the Royal Navy, and in 1921 became sole agent for Greece of Marconi's Wireless Telegraph Co., Ltd., and of the Société Anonyme Internationale de T.S.F. He is the author of the standard Greek instructional books on wireless, and has achieved some successes in the realms of poetry and the drama. Address: 45, Nikis Str., Athens.

Austin, Louis Winslow, Ph.D., D.Sc.—Head of the U.S. Naval Radiotelegraphic Laboratory, Washington, D.C., since 1908. Son of Professor L. A. Austin, of Middlebury College. Educ. Middlebury College, Clark University, and the Universities of Strassburg and Berlin. Assistant Professor of Physics at the University of Wisconsin, then joined the staff of the Physikalisch-Technische Reichsanstalt, Berlin. Specially interested in quantitative high-frequency measurements. Delegate to the London International Radiotelegraphic Conference; President of the Institute of Radio Engineers, 1914; Vice-President of the International Union for Scientific Radiotelegraphy; Delegate to the Radiotelegraphic Technical Conference, Paris, 1921. Address: Radio Building, Bureau of Standards, Washington, D.C.

Ballantine, Stuart.—B. September 22nd, 1897. Philadelphia, Pa. Educ. Philadelphia Public Schools, studied mathematics at Drexel Institute. Engaged in electro-chemical research, H. K. Mulford Company, 1916; and telephone engineer, Bell Telephone Company, 1916-17. Took up development of radio compass for U.S. Navy Department, and was in charge of this work from 1917-20. At present pursuing special studies in mathematical physics at Harvard University. Address: 15, Sumner Road, Cambridge, Mass., U.S.A.

Bangay, Raymond D.—B. Lyme Regis, 1883. Educ. Epsom College and Finsbury Technical College. Joined the Marconi Company, 1902. Spent five years in America, during which time was engaged in different branches of the Service. Returned to England and studied Military Wireless Stations. Chief of the Field Station Department, Marconi's Wireless Telegraph Co., Ltd., 1914. Chief of Designs Department, of the same company, 1921. Author of "The Elementary Principles of Wireless Telegraphy" and "The Oscillation Valve." Address: Gresham Cottage, Brentwood, Essex.

Beggerow, Dr. Hans.—B. September 30th, 1874. Educ. University of Berlin and Freiburg-in-Breisgau, where he obtained his Doctorate. From 1901 till 1919 chief expert adviser to the German Admiralty in all matters concerning wireless telegraphy. Similar position in the Prussian Army, 1906-14. Delegate of the Imperial German Government to the three International Radio Conferences of 1903, 1906, and 1912. Retired November, 1919. Occupied with private scientific work only. Address: Berlin, W.15, Meierottostr, 3.

Bellini, Dr. Ettore.—B. Foligno, Italy, April 19th, 1876. Educ. Naples University. Electrical Engineer to the Royal Italian Navy, 1901. Chief of the Naval Electrical Laboratory at Venice, 1906. Responsible for carrying out research work dealing with the employment of wireless telegraphy on warships and submarines. Joint inventor with Capt. Tosi, of the Radio-goniometer.

Bethenod, J. F. J.—Consulting Engineer to the French Société Radio-Electrique. B. Lyons, 1883. Educ. Central School of that city. For a number of years acted as the Assistant of Professor André Blondel. From 1903 onward, published a large number of theoretical articles on Electro-Dynamic Machinery, and has entered into business relationship with a number of Constructional Engineering Houses for the exploitation of his inventions. After a term of military service in the Engineers, specialised in wireless telegraphy. In this field, both scientific investigation and industrial practice owe several important contributions to his activities. A number of wireless stations of varying power have been installed, wherein his devices are utilised. Of recent years, M. Bethenod has turned his attention to high-frequency alternators, and has built machines giving remarkable results.

Bhering, Francisco, Professor of Geodesy and Astronomy in the Polytechnic School of Rio de Janeiro. Director of the Technical Branch of the Telegraphic Administration. B. Uberaba, State of Minas Geraes, Brazil, January 1st, 1867. Under his initiation and supervision survey and mapping of Brazil undertaken in unified maps

on the scale of one millimetre per kilometre. Represented Brazil as delegate at the International Telegraphic Conference of 1903, at the Radiotelegraphic Conference, London, in 1912, and at the Time Conference, 1912. Member of the mixed Civil and Military Commission organised to deal with wireless matters. Author of a number of works on civil engineering, geography, and telegraphy. Address: Rua Conde Irajá No. 111, Rio de Janeiro, Brazil.

Binyon, Major Basil, O.B.E., B.A., A.M.I.E.E., Managing Director Radio Communication Company, Ltd.—B. Ipswich, April 23rd, 1885. Educ. Leighton Park, Reading; Trinity College, Cambridge. Took B.A. degree Natural Science Tripos, 1907, and post graduate course Electrical Engineering. Appointed engineer to Cie. Generale Radiotelegraphique of Paris, 1911. Appointed General Manager Anglo-French Wireless Co. Granted commission in R.N.A.S., 1914. Appointed Officer-in-Charge Wireless Experimental Department of R.N.A.S., 1916. Promoted Squadron Commander, 1917. Awarded O.B.E. (military), 1918. Appointed Major R.A.F. Member of the Institute of Radio Engineers. Vice-Chairman, Wireless Society of London. Address: 34, Norfolk Street, Strand, W.C.2; "Hawthorndene," Hayes, Kent.

Bjarnov, Alexander William.—Telegraph engineer; Engineer-in-Chief of the Danish Telegraph Dept.'s Third Engineering District; Fellow of Danish Engineers' Association and of the Electrotechnic Association (Elektroteknisk Forening); member of the Board from 1911 to 1919; Associate of the American Scandinavian Foundation. B. Copenhagen, 1874. Studied Polytechnic Academy, Copenhagen. Attached to the Telegraph Dept. since 1903. Passed through the Naval and Torpedo Department Spark Telegraph School for Officers in 1907. Since 1909, together with Helmuth Schledermann, has supervised the examination of wireless operators and the inspection of wireless stations on board ships flying the Danish flag. Address: Gl. Kongevej 96, Copenhagen V.

Bjoerkman, S. O. V.—B. 1883. Since 1911 Superintendent of the Wireless Station at Nya Varvet, near Gothenburg, Sweden. Address: Nordhemsgatan 33, Gothenburg.

Blandy, Col. Lyster Fettiplace, D.S.O., Controller of Communications at the Air Ministry; Officer of the Legion of Honour; Chevalier of the Order of the Crown of Belgium; Mons Star with bar; General Service and Victory Medals; Croix de Guerre of Belgium. B. September 21st, 1874. Educ. Haileybury College and Royal Military Academy, Woolwich. Entered Royal Engineers, March, 1895; Captain, 1904; Major, 1914. From 1908–12 Inspector Royal Engineers Stores at Woolwich, during which period he had much to do with Army Field Wireless Sets. In the start of 1913 took over command of a small unit of thirty to forty men, the Wireless Signal Company. From 1914–17 in charge of Wireless Communication of the B.E.F., France. Became Chief Experimental Officer of Army Signals Experimental Establishment, July, 1917. Chief Experimental Officer, R.A.F., April, 1918, and thence transferred to present post. Address: Naval and Military Club, London.

Blondel, André E.—B. Chaumont, France, 1863. Graduated at Paris University. Contributor to learned societies and technical journals on several subjects, including wireless telegraphy. Invented (1893) a new apparatus, which is known as the "Oscillograph," and which opened a fresh field for the study of alternate currents. Was the first to explain, mathematically (1893), the effect of inertia in the hunting of alternators. Among his other activities in wireless telegraph, mention should be made of directed waves produced by a double aerial oscillating on the fifth harmonic, and also of a system of acoustically syntonic wireless telegraphy.

Blondlot, Professor Prosper René.—B. Nancy, 1849. After completing his scientific studies in Paris, returned to Nancy. Became Professor at the Faculty of Sciences. Now Hon. Professor and Correspondent of the Institute of France. Devoted considerable study to the problem of electromagnetic waves, the main object of his researches being to determine the speed of propagation of such waves. In 1891 he found for this speed the value 302,200 km. per second, and, in 1893, by another and quite different method, the value 297,200 km. per second. Has also investigated the laws of propagation of wireless waves in various media.

Boys, Charles Vernon, F.R.S.—Officier de l'Instruction Publique (France); Hon. Member New York Academy of Sciences, also of Physical Society, Moscow; Past President Physical Society of London, Educ., Marlborough; Royal School of Mines. Is the author of numerous papers published by the Royal Society and others. Address: 66, Victoria Street, S.W.1.

Bradfield, William Walter, C.B.E.—Joint General Manager Marconi's Wireless Telegraph Company, Ltd., and Marconi International Marine Communication Company, Ltd. B. London, 1879. Entered the Wireless Telegraph & Signal Co., Ltd., 1897. Electrical assistant to Senatore Marconi all through the course of the latter's experimental work in Radiotelegraphy on Salisbury Plain during 1897. Installed the first wireless apparatus on British battleships, 1899, and a little later assisted in demonstrations to the United States Government on board the United States battleship "Massachusetts." In 1901 similar demonstrations conducted by him for the French Government resulted in the establishment of wireless communication between the French Riviera and Corsica. Supervised in 1901 the erection of the well-known station at Siasconset and the Nantucket Lightship. Chief Engineer to the Marconi Wireless Telegraph Co. of America, 1902. Deputy Manager of Marconi's Wireless Telegraph Company, and of the Marconi International Marine Communication Co., Ltd. Manager of both concerns, 1910. Elected to the Board of the two companies, 1917. Address: 1, St. James's Place, London, S.W.

Braillard, Raymond, General Manager, Société Indépendante Belge de Télégraphie sans Fil. B. 1888, Dept. of Jura, France. Studied engineering at the Ecole des Arts et Métiers, Cluny, and Ecole Superieure d'Electricité, Paris. Served two years in the electrical industry. Military service at the Eiffel Tower Wireless Station. Engineer of the Société Française Radio Electrique. Visited Belgian Congo (1911) as Chief Engineer of Wireless Telegraphy. Installed the network of Congoese Stations. Before the war installed the powerful station at Laeken, near Brussels. Secretary of the International Commission on Scientific Wireless Telegraphy. During the war attached first to the Wireless Service of the Belgian Army, then to the Wireless Station at Croix d'Hins (Bordeaux). Author of several scientific papers. Address: 23, Boulevard de Waterloo, Brussels.

Branly, Edouard.—B. Amiens, October 23rd, 1844. Educ. St. Quentin College and Henry IV

College, Paris. Fellow of the University, Doctor of Physical Science, and Doctor of Medicine. Some of his works relate to the electrical conductivity of radio-conductors. International Jury of Superior Precept Instruction awarded him (1900) *grand prix* for his exhibition of radio-conductors. French Minister of Public Instruction made him an Officer of the Legion of Honour in recognition of the part he had played in connection with the discovery of "Wireless Telegraphy." Has constructed various independent distributing apparatus for producing telemechanical effects without wires. Elected a member of the Academy of Science, Paris, January, 1911.

Brenot, Commandant Paul.—B. Ruoms, Ardèche, September 19th, 1880. Educ. Ecole Polytechnique. Transferred to the Central Establishment of Radiotelegraphy, and studied the installation of wireless at most of the military stations, both permanent and mobile. Represented wireless telegraphy at the International Electrical Congress at Marseille, 1908, and later on collaborated with M. Blondel in various investigations into the employment of frame aerials for radiogoniometry and high tension arcs for wireless telegraphy and telephony. Carried through some important experiments on the employment of wireless telegraphy in aircraft, 1910–11, which gained for their originator the Cross of the Legion of Honour. Before the war, head of the practical work in the advanced wireless school. Technical adviser to the Minister of the Colonies, 1911, and took over the organisation of the Colonial systems, particularly those applying to communication at a great distance. Delegate of the Colonial Office at the International Radiotelegraphic Conference, London, 1912; at the International Time Conference, Paris, 1912–13; and at the International Safety-at-Sea Conference, London, 1913–14. During the war, whilst remaining in charge of French Colonial wireless, appointed head of the Radiotelegraphic Centre at Paris and of the Eiffel Tower Station. Left Army, 1919. Became Technical Manager of the Société Française Radio-Electrique and of the Compagnie Générale de Télégraphie sans Fil.

Bright, Sir Charles, F.R.S.E., M.Inst.C.E., F.R.Ae.S., M.I.Mech.E., M.I.E.E., F.I.Radio.E., F.R.G.S., F.S.S., Principal of Sir Charles Bright & Partners, Consulting Engineers, 146, Bishopsgate, E.C.2.—B. London, 1863. Educ. Lancing College and King's College. Engineer and Electrician for the construction, testing, laying and repairing of over 25,000 miles of submarine cable. Gave special expert evidence before Inter-Departmental Cables Communication Committee (1902), House of Commons Radio-telegraphic Committee (1907), and Dominions Royal Commission (1911). Member of R.F.C. (Air) Enquiry Committee (1916), and of British Association War and Engineering Committee (1916). Contributed papers, addresses and lectures to numerous learned societies. Author of various standard works, notably "Submarine Telegraphs," "The Story of the Atlantic Cable," "The Administration of Imperial Telegraphs" and "Telegraphy, Aeronautics and War." Represented Australia as sole delegate at the International Radiotelegraphic Conference (1912). Vice-President, Wireless Society of London and Institute of Aeronautical Engineers. Addresses: Leigh Grange, Tonbridge, and Athenæum Club, Pall Mall, London, S.W.1.

Brown, Frank James, C.B.E., M.A., B.Sc.—B. 1865 near York. Educ. privately. Grad. London University (Honours and Prizeman). Entered the Higher Division of the Civil Service, 1886. Appointed to the Post Office. Principal Clerk, 1910. Assistant Secretary in charge of Telegraphs, March, 1919. Member of British Peace Delegation, 1919, in capacity of expert adviser on telegraph questions. Post Office representative on Imperial Communications Committee, and Member of Wireless Telegraph Sub-Committee of that Committee. Member of Imperial Wireless Telegraphy Committee appointed by Government in 1919 to formulate a scheme of W/T for the Empire. Senior British Delegate to Conference at Washington on Telegraph Communications, 1920. Address: G.P.O., London.

Brown, Sidney George, F.R.S. M.I.E.E.—B. 1873, Chicago, U.S.A., of English parents, and brought to England when eighteen months old. Educ. Harrogate and London University. Made a special study of submarine telegraphy and is inventor of the magnifying cable relay. Invented the drum cable relay and the magnetic shunt, 1898. Since that date he has also devoted much attention to telephony and wireless telegraphy and has achieved some important results, such as the carbon telephone relay, telephone transmission on land trunk lines, the improved wireless telephone receiver, and other inventions. Vice-President of the Wireless Society of London.

Bucher, Elmer E.—B. Akron, Ohio, November 11th, 1885. Educ. Academy Oberlin, Ohio. Joined the De Forest Wireless Telegraph Company as experimental engineer, 1903. Constructed several high-power stations in the Middle West and on the Gulf Coast for this firm. Joined the United Wireless Telegraph Company as installation and experimental engineer, 1907. Installed the first ship stations of the United States Navy. Organised the United Wireless Telegraph Company's School, 1909. Instructing engineer and chief inspector of that company for more than two years. Associated himself with the Y.M.C.A., New York, in the initiation of wireless schools, 1910. Joined the Marconi Wireless Telegraph Company of America as instructing engineer, 1912. Organised Marconi Institute, 1917, and acted in capacity of Director. Joined Commercial Department, Radio Corporation of America, 1920. Devoted many years to experimental long-distance wireless work and holds a large number of U.S. wireless patents. Held position as Technical Editor of "Wireless Age" during the period 1913–18. Author of "Practical Wireless Telegraphy," "Vacuum Tubes in Wireless Communication," "Wireless Experimenters' Manual," and other works. Member of the Institute of Radio Engineers. During the year 1920 appointed Commercial Engineer of Radio Corporation of America and placed in charge of Foreign Government and Miscellaneous Radio Sales.

Bullard, Rear-Admiral W. H. G., U.S.N.—B. December 6th, 1866, State of Pennsylvania, U.S.A. Graduated, United States Naval Academy, 1886. Served on ships of the Navy on the Atlantic, South Atlantic, Pacific and Asiatic Stations, with shore duty, with particular reference to the science of Electrical Engineering, in which he had specialised. First Superintendent of the Naval Radio Service, 1912–16. Under his supervision the communication system of the Navy Department was developed and enlarged. Delegate-plenipotentiary of the United States at the International Conference for Safety of Life at Sea, London, November, 1913. In charge, on behalf of the United

States Navy, of the wireless operations contained in the series of experiments carried out between the Eiffel Tower and Arlington to determine longitude by means of wireless telegraphy. During the World War his sea service was in the Sixth Battle Squadron of the British Grand Fleet, serving in the North Sea. After the war he returned to Washington in charge of the Communication Service of the Navy Department, with the title "Director Naval Communications," the former Radio Service having been enlarged to include all forms of communication.

Burstyn, Dr. W.—B. Austria, 1877. Educ. Vienna University. Started his career as electrical engineer with the Siemens-Schuckert Werke, Charlottenburg. Later engineer with Gesellschaft fur Drahtlose Telegraphie. Developed together with Baron Lepel (1907–12) the quenched spark system. Proprietor of a Techno-Physical Laboratory. Now at Physics and Technical Laboratory and is *privatdocent* for wireless telegraphy and electric clinics, Technical High School, Charlottenburg. Address: Berlin—Wilmersdorf, Prinzregentenstrasse 23.

Carpentier, Jules.—Member of the Académie des Sciences, Bureau des Longitudes, Commander of the Legion of Honour, President of the Société de Publications Radiotechniques. B. Paris, 1851. Joined Ecole Polytechnique, 1871. Commenced work with the State Railways. In 1876 appointed Principal Stores Engineer of Lyons Railway Company. For his electrical work shown at the Electrical Exhibition of 1881, he obtained the Gold Medal and the Cross of Chevalier of the Legion of Honour. Later became President of several learned Societies. Entered the Bureau des Longitudes, 1897. Invented several pieces of mechanism for musical instruments and photographic apparatus. Inventor of a type of periscope for submarines. Interested himself from the beginning in radiotelegraphy. Founder of the Compagnie Générale Radiotélégraphique, which was later absorbed by the Compagnie Générale de Télegraphie sans Fil.

Chaffee, Professor E. L., Assistant Professor of Physics, Harvard University.—B. April 15th, 1885, Somerville, Mass. Educ. High School, Somerville, and Massachusetts Institute of Technology in Boston. Graduated B.S. in Electrical Engineering, 1907. Awarded the degree of M.A. in Physics, Harvard University, 1908, and Ph.D., 1911. Conducted courses in physics and radiotelegraphy at Harvard University. Engaged in research and consultation work in radiotelegraphy. Author of several papers, including "A New Method of Impact Excitation of Electric Oscillations and their Analysis by the Braun Tube Oscillograph," published 1911. During the war engaged in developing some radio apparatus, with which he experimented in France, 1918. Has published Physics Laboratory Manuals.

Chamberlain, Eugene Tyler.—Son of General Frank Chamberlain. B. in Albany, N.Y., September 28th, 1856. Educ. Albany Academy and Harvard College. Graduated with honours in Metaphysics, 1878. In business for two years, then took up journalism and acted as legislative and political correspondent to the Associated Press. Came to Washington, 1893. Appointed Commissioner of Navigation by President Cleveland. In 1903, on the creation of the Department of Commerce and Labour, he joined others in urging the importance of wireless telegraphy as a means of promoting safety of life on merchant vessels at sea, and he has since played a prominent part in promoting legislation on this subject. Delegate for the U.S.A. to the Convention on Safety of Life at Sea, at London, 1914. Address: Department of Commerce, Bureau Navigation, Washington, D.C.

Chevrelière, Jean Marie Charles Aymé, Baron de la.—B. Poitiers, France, 1858. Educ. in that city. Member of Parliament, Mayor and General Counsellor. After a course at the Military Academy of St. Cyr (1877–79), followed by specialised training at Saumur, remained for fifteen years in the active army as cavalry officer, retiring with the grade of captain in the Reserve, 1892. Member of Légion d'Honneur, Military class. Mobilised from August 2nd, 1914, to July 5th, 1917. Joined the Board of the Belgian "Société Anonyme de T.S.F.," 1901, and subsequently took a prominent part in the initiation of the "Compagnie Française Maritime et Coloniale de T.S.F.," now known as "Compagnie Industrielle de Mécanique et d'Electricité," of which he is President and Managing Director. From early 1914 to the end of January, 1918, occupied the post of managing director of the Cie Universelle de Télégraphie et de Téléphonie sans Fil, which on February 12th of the same year was merged in the Cie. Générale de T.S.F., of which he is vice-president. Director of "Société Française Radioélectrique" and "Compagnie d'Exploitation Radioélectrique." Also Director of "Cie. Radio France" and of "Cie. Sté. Franco Argentine." Address: 23, rue Dumont d'Urville, Paris.

Childs, H. B. T., A.F.R.Ae.S., A.M.I.E.E.—Chief of Field and Air Division, Marconi's Wireless Telegraph Co., Ltd. B. Llandilo, S. Wales, 1884. Educ. King's School, Canterbury; London University. Joined the Marconi Company, 1905. Served as Engineer in Russia, Canada, Spain, and Egypt. Joined Royal Flying Corps, autumn, 1915. Served in France, November, 1915, to August, 1917. Appointed to command W/T Experimental Establishment, R.A.F., August, 1917. Promoted Lieut.-Col., December, 1917. Appointed in charge of W/T for the R.A.F. in France, May, 1918, till April, 1919. Mentioned in dispatches, 1916, 1918. Address: Holdenhurst, Oatlands Avenue, Weybridge.

Chree, Charles.—Superintendent of Kew Observatory since 1893. Assistant Director of the Meteorological Office. B. 1860, Lintrathen, Forfarshire. Sc.D. of Cambridge, Hon. LL.D. (Aberdeen), F.R.S. Graduated M.A. Aberdeen (1879) with first-class honours in Mathematics and Natural Philosophy. At Cambridge, in 1883, was sixth wrangler, gaining also first-class honours in Mathematical and Natural Sciences Triposes. Fellow of King's College, Cambridge (1885); re-elected Research Fellow (1891). ex-President of Physical Society of London; member of the British Association Committee for Radiotelegraphic Investigation. Holds Watt Medal of Institution of Civil Engineers. Largely concerned with geophysics, especially terrestrial magnetism and atmospheric electricity. For his researches in the former subject received Hughes Medal from the Royal Society. Publications: "Studies in Terrestrial Magnetism," articles in "Encyclopædia Britannica." Address: 75, Church Road, Richmond, Surrey.

Cohen, Louis, Ph.D., Consulting Engineer.—B. 1876. Educ. at Armour Institute of Technology, University of Chicago, and Columbia University. On scientific staff of the Bureau

of Standards, 1905–09.! Chief of Research Department of the National Electric Signalling Co., 1910–12. Engaged in consulting practice since 1912. Professor of Electrical Engineering, George Washington University. Especially interested in the subject of electrical oscillations. Author of "Formulæ and Tables for the Calculation of Alternating Current Problems," and scientific and technical papers dealing with problems in wireless telegraphy and kindred subjects.

Coursey, Philip R., B.Sc. (Eng.), F.Inst P., A.M.I.E.E., M.R.I. Assistant Editor "The Radio Review."—B. 1892. Educ. University College, London. Awarded Diploma in Electrical Engineering with Distinction. Graduated with first-class Honours in Electrical Engineering at the University of London. Subsequently acted as Assistant to Dr. J. A. Fleming, F.R.S., in the Electrical Engineering Department and Research Laboratories of University College, London. From 1915–18 served as Inspector of Wireless Telegraph Apparatus for the Admiralty; afterwards appointed to the Staff of H.M. Signal School, Portsmouth, as Research Physicist. Sometime Research Electrical Engineer to the Dubilier Condenser Co. Author of papers on Radiotelegraphy and Telephony, read before a number of Societies, and of "Telephony without Wires." Address: 138, Muswell Hill Road, London, N.10.

Craioveanu, Eugen.—B. 1872. Secondary studies and graduated in Physics and Chemical Science in Roumania. Sent by Roumanian Post Office Department to study as Telegraph Engineer at Ecole Supérieure des Postes et Télégraphes, Paris, and Post und Telegraphen Hochschule, Berlin. Engineer in all branches of Telegraphy and Telephony, Roumanian Post Office. District Director, Chief of Telegraph Postal Service during Balkan War (1913), and also 1916 to 1917. Sub-Director-General of Roumanian Posts, Telegraphs and Telephones, January, 1920. Resigned August 1st, 1920. Engaged in research for modernising technical telegraphy and telephony. Director-General of Roumanian Marconi Company. Address: 4, Strada Saguna, Bucarest-Roumania.

Crawley, Lieut.-Col. C. G. G., Royal Marine Artillery (ret.), M.I.E.E., Deputy Inspector of Wireless Telegraphy, General Post Office. Employed at Wireless Telegraphy in the Navy, 1903 to 1913, as Experimental, Instructional, and Fleet Wireless Officer. Deputy Inspector of Wireless Telegraphy in the Post Office, 1913. Returned to the Naval Wireless service (1914) for the period of the war. During the war served in the Grand Fleet, in command of the R.N.V.R. Wireless School, at the Admiralty, and supervised the erection and working of various Naval stations abroad. Mentioned in Gazette for valuable services, and received letters of appreciation from the Admiralty. Officer of the Order of Aviz. Order of Liakat. R.H.S. testimonial for saving life. Resumed his duties in the Post Office, 1919. Address: General Post Office, London, E.C.

Cresswell, F. G., A.M.I.E.E.—Radio Commander in the Australian Navy during the war. Entered upon professional career, 1897, and received his training and experience with engineering firms in Australia. Entered Government service in the Electrical Engineer's Branch of the Postmaster-General's Department, Melbourne. Commissioned in the Naval Forces of the Commonwealth as Engineer Sub-Lieutenant detailed for electrical duties, 1907. Served in the Royal Australian Navy from the time of its inauguration. Appointed Fleet Wireless Telegraph Officer, 1912, rising to the rank of Radio Commander and Acting Director of the Radio Service, July, 1916. On his return from naval operations in the Pacific during the early stages of the late war, was selected to take over the control, under the Naval Board, of the Wireless Telegraphy Department of the Commonwealth, which had been transferred by Act of Parliament to the control of the Royal Australian Navy. His first work was that of organising the Commonwealth Radio Service on naval lines and under naval discipline. Assisted at the capture of the German high-power wireless stations at Samoa, Nauvu, and Rabaul, being mentioned in despatches. Member of the Institute of Engineers, Australia. Appointed Electrical Lieut.-Commander Royal Australian Navy since the transfer of the Commonwealth Radio Service back to the Postmaster-General's Department and the disbandment of the Royal Australian Naval Radio Service. Director of Signal Division Naval Staff. Address: Navy Office, Melbourne.

Cross, Professor Charles R.—B. at Troy, New York, March 29th, 1848. Returned with his father to Newbray Port, Massachusetts, 1862. Graduated at the Putnam Free School in that city, 1865, and engaged temporarily in teaching. Graduated at Massachusetts Institute of Technology, 1870. Appointed instructor in Physics. Became a Junior Professor in Physics, 1875. Placed in charge of the Dept. of Physics, 1877, and later Thayer Professor of Physics and Director of the Rogen Laboratory of Physics. Became interested in the industrial applications of electricity. Lectured upon this subject, 1881. Retired from active teaching, 1918, and made Professor Emeritus. Author of papers embodying the results of researches upon electric and acoustic subjects. Has delivered many public lectures, a number of which were before the Lowell Institute of Boston. Acted as expert for the American Bell Telephone Company throughout the extended litigation concerning the Bell patents, as well as in other telephone cases. Expert for the American Marconi Company in the suits which resulted in the establishment of its fundamental patents. Fellow of the American Academy of Arts and Sciences. Chairman of the Rumford Committee of that institution for twenty-two years. President of the Elizabeth Thompson Science Fund, a member of the American Association for the Advancement of Science, the British Association for the Advancement of Science, and of the American Institute of Electrical Engineers, of which he was one of the original vice-presidents. Past Chairman of one of the three Lectures of the Electrical Congress at the World's Columbian Exhibition at Chicago, 1893.

De Forest, Dr. Lee.—B. Council Bluffs, Iowa, August 26th, 1873. Graduated Ph.D., 1899. Founded the De Forest Wireless Telegraph Co., 1902, the Radio Telephone Co., and the De Forest Radio Telephone Co., 1907. Awarded gold medal for radiotelegraphic work, St. Louis Exhibition, 1904. He distinguished himself in the American-Spanish War, 1898. Member of the Institute of Electrical Engineers of the Franklin Institute, and of the Institute of Radio Engineers.

De Groot, Doctor Engineer Cornelis Johannes, Chief of the Radiotelegraphic Service in the Dutch East Indies.—B. at Den Helder, January 27th, 1883. Educ. as Mechanical Engineer at Technical High School, Delft, and afterwards at Karlsruhe, where he obtained the diploma of

Electrical Engineer. During 1915-16 took degree as Doctor in Technical Sciences at Delft University. Spent eighteen months in the service of the G.E.C. of Berlin and thence transferred himself to the Dutch East Indian Government, superintending the erection of various wireless stations in the Indian Archipelago. In 1915-16 visited Europe on furlough and took Doctor's degree on the thesis of "Radio-telegraphy in the Tropics," a notable production which obtained him much *kudos* when subsequently published. A supplementary dissertation upholding the advisability and technical possibility of establishing direct radio communication between Holland and its Colonies won him the honour of having his Doctor's degree conferred *cum laude*, and he was subsequently instructed to carry into practical effect the measures he advocated in that essay. His initial experiments in establishing such communications met with success. Has made many contributions to radio literature, one of the best known being a monograph on "The Nature and Elimination of Strays," originally read before the Institute of Radio Engineers, New York.

Desbarats, George Joseph, C.M.G., B.Sc. Deputy Minister and Comptroller of the Canadian Naval Service, since June, 1910.—B. Quebec, January 27th, 1861. Educ. Public Schools; Terrebonne College, Ecole Polytechnique, Montreal (honours and gold medal, 1879); Laval University (B.A.Sc., 1901). Engineer on construction of canals and other public works: assistant to late John Page, Chief Engineer of Canals; Inspector, Railway Construction, B.C., 1892-96; Engineer of Construction, Galops Canal, 1896-99; employed in hydraulic survey work, St. Lawrence River, three years; rebuilt and enlarged the Government shipyard, Sorel, Quebec, 1901; Acting Deputy Minister of Marine and Fisheries, Ottawa, 1908-09; Deputy Minister, 1909-10; Plenipotentiary for Canada at the Radiotelegraph Conference held at London, England, 1912. Member of the Canadian Society Civil Engineers, 1897; Councillor, 1907; Vice-President, 1909; Councillor, Ecole Polytechnique, 1909; Plenipotentiary for Canada to International Seaman's Conference, Genoa, 1920. Address: Ottawa, Canada.

Destruge, Guillermo, Director General of Telegraphs, Telephones and Wireless, Ecuador, February, 1898, to February, 1906, and from March, 1912, in which capacity he is still serving. Established duplex telegraphic system and telephones in Quito, the capital, 1900. The installation of wireless telegraphy in Ecuador has been instituted under his direction. President of the Radiotelegraphic Commission of the Republic. The personnel of the Telegraphic and Telephonic service of Ecuador presented to him on August 10th, 1920, as an appreciation of his good work, an artistic and valuable inscribed gold tablet. Author of several scientific publications. Address: Apartado No. 59, Quito, Ecuador, South America.

De Valbreuze, R.—One of the first promoters of the use of undamped waves. Presented (1902) an important memorandum to the French Ministry of War on this subject. Attached as Officer of Engineers to the Central Establishment of Military Telegraph *Matériel*. In this capacity studied means for producing undamped waves by means of mercury arcs. Left Army for industry. Published (1906) a work on wireless telegraphy. During the war was a Captain of Engineers attached to the Radiotelegraphic Centre in Paris. Sometime Vice-President of the Société Internationale des Electriciens. Director of several Technical Societies. Chevalier of the Legion of Honour.

De Vasconcellos e Sa, Dr. Alexandre, State Secretary of the Portuguese Colonies.—B. November 28th, 1872. Graduated as a Doctor of Medicine in the Medical School at Lisbon. Joined the Portuguese Navy, 1894, where he gained a reputation as a physician and surgeon. After the proclamation of the Portuguese Republic in 1910 interested himself in politics, and as a member of Parliament specialised in Colonial subjects. Served in the Barué Campaign, 1912. Chief Health Officer to the expedition sent to Cuamato when the Germans invaded Portuguese territory, 1913-15. His services won him the highest military distinction granted by the Portuguese Navy. On returning from the expedition to Angola was appointed Commissioner of the Portuguese Government to the Mozambique Company. Secretary of State to the Colonies, May 14th, 1918. In this capacity devoted considerable attention to the development of radiotelegraphy in the Portuguese colonies.

Dowsett, H. M., M.I.E.E., F.Inst.P.—Born in London, February, 1879. Educated at the Central Foundation School, London; École Internationale, Paris. Trained as an electrical engineer at Finsbury Technical College under Professors S. P. Thompson and John Perry. His early practical experience was obtained with the British Thomson-Houston Co., Bankside, at the St. Pancras Electricity Supply Station, King's Road, and with S. Z. de Ferranti, Ltd., Charterhouse Square. In April, 1899, he joined the engineering staff of the Wireless Telegraph & Signal Co., now known as the Marconi's Wireless Telegraph Co., Ltd. He was associated with much of the early developmental work of this company, and after having erected stations and demonstrated wireless telegraphy ashore and afloat for commercial and war purposes in all parts of the world, was appointed in charge of the test rooms and drawing office at the Hall Street works, Chelmsford, in August, 1908. In 1912 he was responsible for the layout and equipment of the testing laboratories of the New Street works, which was opened in June of that year, and has held the position of chief of the testing department from that date to the present time. He revised the "Handbook for Wireless Telegraphists," of J. C. Hawkhead, for the second edition published in 1915, and is the author of "Wireless Telegraphy and Telephony: First Principles, Present Practice and Testing," published in 1920. His recent paper on "Carborundum and its Rectification Effect," which appeared in the *Radio Review* for November and December, 1921, brings forward evidence that rectification effect is a property of crystal structure. Address: Marconi Works, Chelmsford, Essex.

Dubilier, William.—B. July 25th, 1888, in the U.S.A. Consulting radio engineer and inventor. Devoted much attention to wireless telegraph, telephone, and high-frequency experiments. Since 1904 consulting radio engineer. Principal of the Dubilier Electrical Syndicate, Ltd., London, England, and of the Dubilier Condenser Co., Inc., New York. Inventor of the Dubilier Mica Condenser. Obtained over 150 patents and applications for wireless apparatus. Address: Aero Club, New York.

Eccles, W. H., D.Sc., A.R.C.S., M.I.E.E., F.R.S.,—Dean of the City and Guilds of London Technical College, Finsbury, E.C., and Professor of Applied Physics and Electrical Engineering.

Vice-President of the Institution of Electrical Engineers, of the Physical Society, and of the Institute of Physics; First Chairman of the Wireless Section of the Institution of Electrical Engineers; Honorary Secretary of the British Association Committee for Radiotelegraphic Investigation.—B. Furness, Lancs, 1875. Entered the Royal College of Science, South Kensington, in 1894. Three years later was appointed demonstrator in the Physics Laboratory at the College, and in 1898 graduated at the London University with first-class honours in Physics. In 1899 he entered Mr. Marconi's laboratory at Chelmsford and spent a great part of his time in the investigation of electrical oscillations of air wires and in "jiggers." Devised a laboratory method for testing and classifying coherers, and results of a later study of coherers were presented as one of his D.Sc. theses. In 1901 was appointed Head of the department of mathematics and physics at the South-Western Polytechnic, Chelsea, and afterwards University Reader in Graphics at University College, London. Address: 2, Ryder Street, St. James's, S.W.1.

Eichhorn, Gustav, Ph.D.—B. Düsseldorf (Germany), December 1st, 1867. Studied physics. After the sudden death of his father became managing director of the paternal paper-mills for ten years. Returned to the profession of his choice and continued his interrupted studies. After three years at Berlin, Munich, and Zürich, took the degree (Phil. Dr.) at the last-named University. Entered the wireless telegraph laboratory of Prof. Braun, at Siemens and Halske, in Berlin. Appointed manager of their experimental stations on the Baltic, where for about eighteen months he conducted a number of investigations. Publications: Drahtlose Telegraphie (Leipzig, 1904), Wireless Telegraphy (London, 1906). Collaborator of various technical journals. Inventor of the buzzer-device which is used in connection with wave-meters and other instruments in the nature of oscillators. Returned to Zurich, 1905, and launched the *Jahrbuch der drahtlosen Telegraphie und Telephonie*, 1907. Engaged in practical and theoretical work in wireless telegraphy and telephony. Address: Hauptpostfach 6123, Zurich, Switzerland.

Eisenstein, S. M.—B. Kief, Russia. Educ. Kief University. Studied at the University of Berlin and the Charlottenburg Polytechnic. First turned his attention to wireless telegraphy, 1900. Obtained his preliminary wireless patent and established a private experimental laboratory, 1904. General Soukomlinoff, then commanding the troops of the Kief Division, heard of the young wireless enthusiast and encouraged him to carry out experiments on a large scale, eventually prevailing on the Russian War Office to provide the young scientist with sites for the erection of stations. The action, taken in consequence by the War Office, resulted in the realisation of the necessity for forming a wireless company; the project speedily materialised and Mr. Eisenstein changed his headquarters from Kief to Petrograd. The new departure speedily justified itself, and in 1911 the original company coalesced with the Marconi Company, and the reconstructed Russian Organisation, with Mr. Eisenstein as Director and Principal Technical Adviser, assumed responsibility for the development of Russian wireless.

Erskine-Murray, James, D.Sc., F.R.S.E., F.I.P., M.I.E.E., F.I.Radio E.—B. Edinburgh, October 24th, 1868. After six years' study and research under the late Lord Kelvin at Glasgow University entered Trinity College, Cambridge, as a research student. Assistant Professor of Physics and Electrical Engineering in the Heriot-Watt College, Edinburgh, 1896–98. Appointed experimental assistant to Mr. Marconi, 1898. Lecturer and Demonstrator in Physics and Electrical Engineering at University College, Nottingham, 1900. Lecturer in Electrical Engineering at the George Coates Technical College, Paisley, 1905. Consulting work in radiotelegraphy, 1905. Lecturer on Radiotelegraphy at the Northampton Institute, London, 1907–11. Contributed papers to numerous learned societies. Author of several works on wireless telegraphy. Partner in the firm of Clark, Forde, Taylor, and Erskine-Murray, consulting engineers, 1913–18. Joined the Royal Naval Volunteer Reserve, 1917, with rank of Lieut.-Commander. Now serving with the Royal Air Force in charge of the design of wireless instruments and of experimental work. Elected President of Wireless Society of London, 1921. Address: 16, Elmfield Road, Bromley, Kent; Telephone, Bromley 858; Club, Caledonian.

Ewen, Harry Alexander.—B. Aberdeen, December 17th, 1877. Educ. Aberdeen Grammar School; Liverpool Institute. Received Engineering training at Heriott-Watt College. Medallist in Elec. Eng. and Elec. Eng. Hons., 1901–02. Joined Engineering Staff of Marconi's W/T Co., 1902. Appointed Wireless Telegraph Expert to the Brazilian Navy, 1910; later rejoined Marconi's W/T Co., and appointed Chief of Drawing and Design Dept. Address: "Braeside," Priest Lane, Shenfield, Essex.

Faber, R. N. A., Lieutenant-Colonel, Royal Danish Engineers.—Born in Copenhagen, April 29th, 1869.—Chief of Military Wireless Service of Denmark. Delegate to the International Radiotelegrafic Congress of Berlin, 1906, and London, 1912. Member of the Military Telegraph and Telephone Commission and of the Government Radiotelegraph Commission. Knight of the Order of Dannebrog, etc. Permanent address: Ingeniorkasernen, Copenhagen.

Farrand, C. L.—B. Newark, N.J., October 22nd, 1891. Educ. Central High School, Philadelphia, Pa. Wireless operator and instructor, 1909–13. Inspector of construction work, 1913, testing and designing of coastal stations. Assistant to Mr. H. Shoemaker, the research engineer of the Marconi Laboratory, Aldene, N.J. Engineer-designer in Aldene, N.J., 1917, especially devoting his attention to radiotelegraphic research and design. His research work has been particularly associated with the De Forest Valve litigation, the development of valves, and the elimination of static. His activities have been mainly exercised in connection with the design of commercial and naval quenched spark apparatus, regenerative valve receivers and regenerative valve transmitters, both telephonic and telegraphic.

Ferrié, General Gustave, Technical Director of French Military Radiotelegraphy. Officer of the Legion of Honour, D.Sc. of the University of Oxford, Companion of St. Michael and St. George, Commander of the Crown of Italy, Officer of the White Eagle of Serbia, Holder of the Distinguished Service Medal of the United States, Commander of the Double Dragon of China, Officer of La Couronne, etc.—B. at St. Michel de Maurienne (Savoy), November 19th, 1868. His connection with wireless telegraphy started February, 1899, when he was present during experiments of Senatore Marconi between Wimereaux and Dover. Initiated French Military

Radiotelegraphic Service in 1900. Was member of French Delegation to the International Electrical Congress of St. Louis in 1904. Member of the French Delegation to the International Radiotelegraphic Conference of London (1912). Appointed General Secretary of the International Time Conference, Paris (1913). He has, in the course of a brilliant career, written a large number of monographs and periodic contributions dealing with radiotelegraphy and kindred subjects, both from a technical and organisation point of view. Address: Inspecteur Générale de la Telegraphie, 51 bis, Bd Latour Maubourg, Paris.

Fessenden, Reginald Aubrey.—B. Milton, Canada, October 6th, 1866. Educ. New York and Port Hope, Ontario. Inspecting engineer to the Edison Company, New York. Took up teaching work and conducted classes in physics and electrical engineering at Western University, 1892. Professor of Electrical Engineering at Western University, Philadelphia, 1893. Special Agent to the U.S. Weather Bureau, 1900. Has devoted much attention to the development of a system of wireless telegraphy known by his name, and has also carried out important experiments in wireless telephony. Contributor of articles on wireless telegraphy and telephony to many technical journals.

Field, Rear-Admiral F. L., C.B., C.M.G., 3rd Sea Lord and Controller of the Navy; Member of Committee (appointed November, 1919) to advise British Government on Imperial W/T Communications.—B. April 19th, 1871. Entered Royal Navy, July, 1884; promoted Lieut., 1893; qualified as Torpedo Lieut., 1896. Landed in expedition for Relief of Legations at Pekin from H.M.S. "Barfleur," 1900. Mentioned in despatches; wounded at taking of Tientsin Native City. Promoted Commander, 1902; Captain, 1907; Commanded H.M.S. "Duncan," 1910; Superintendent of Signal Schools, 1912; Capt. H.M.S. "Vernon" (Torpedo School), 1914; Capt. H.M.S. "King George V" at Battle of Jutland; mentioned in despatches, awarded C.B. (Military division). Chief of Staff to Admiral Second-in-Command Grand Fleet, 1916. Awarded C.M.G. for this service. Director of Torpedoes and Mining at Admiralty, 1918. Promoted Rear-Admiral, February 11th, 1919. Appointed 3rd Sea Lord and Controller, April 15th, 1920. Address: Admiralty, Whitehall, London, S.W.1.

Fisk, Ernest Thomas, M.I.Radio E.—B. Sunbury-on-Thames, August 8th, 1886. Educ. Primary and High Schools. Studied physics, mathematics, and commercial subjects. After two years with Messrs. Frederick Walton and Co., he entered the British Telegraph Service. Joined the Marconi Company in England (1905). Temporarily engaged in engineering branch of the American Marconi Company, erecting stations on ship and shore. Undertook a special mission to the Arctic icefields, 1909, and demonstrated the possibilities of wireless communication with Newfoundland Sealing Fleet. Visited the Antipodes, 1910, in R.M.S. "Otranto," and demonstrated the use of the Marconi apparatus for the Orient Mail Line of steamers. Again visited Australia, 1911. General Manager with a seat on the board of directors of Amalgamated Wireless (Australasia), Limited, 1913. Revisited England, 1916. Shortly after return to Australia, accepted position as Managing Director of the Company. Tested possibility of direct wireless communication between England and Australia. Gave the first public demonstration of wireless telephony in Australia before the Royal Society of New South Wales. Reorganised manufacturing work. Managing Director of the Australectric Company, now Australectric Limited. Founder and initiator of "Sea, Land, and Air," the first journal in the Southern Hemisphere to deal with aviation and wireless. Established the Australasian branch of The Wireless Press. Member of the Electrical Association of Australia, President of the Wireless Institute of Australia (New South Wales Section), Member of the Sydney Chamber of Commerce and the Chamber of Manufacturers, Member of the Executive Committee, Australasian Industries Protection League, Member Provisional Committee appointed to consider the formation of the Chamber of Science and extending application of science to industry. Chairman Section of Industry, Royal Society of N.S.W., 1920–21.

Fleming, John Ambrose, D.Sc., M.A., F.R.S., University Professor of Electrical Engineering, University of London (1912).—B. Lancaster, November 29th, 1849. Educ. University College School, London; University College; R. School of Mines. Sometime Fellow of St. John's College, Cambridge; Fellow and Hughes Gold Medallist, Royal Society. Lecturer in mechanics and applied science, Cambridge University (1880). First Professor of Mathematics and Physics (1881), University College, Nottingham. First occupant of Pender Chair of Electrical Engineering, University College, London (1885); Vice-President of Wireless Society of London. Sometime Vice-President of Institution of Electrical Engineers and Physical Society. Honorary Member of the Royal Engineers' Institute, Chatham. Scientific Adviser to the Edison and Swan United Electric Light Company, 1882–93. Scientific Adviser to the London Electric Supply Corporation, and many other corporations, firms and companies in electrical matters. Publications: Numerous contributions to scientific literature and research. Author of well-known text-books, particularly on wireless telegraphy. Twice awarded Institution Premium of Institution of Electrical Engineers; also silver medal of Royal Society of Arts, and Bernay's Premium of the Society of Engineers. Awarded the Gold Albert Medal of the Royal Society of Arts in 1921 for his electrical researches and inventions. Widely known as inventor of the Thermionic Valve or Fleming Valve, the judicial decisions on which have declared it to be a pioneer invention of unusual utility, and one that has enormously aided the development of wireless telegraphy. Address: The Pender Electrical Laboratory, University College, Gower Street, London, W.C.1.

Forberg, Olaf E., Director of Telegraphs, Iceland.—B. November 22nd, 1871, in the Province of Finmark, Norway. Early attached to the Norwegian Telegraphic Service, first as a Telegraphic Clerk, later as the head of a station; Manager of the Controlling Station, Veblungsnes, in the Romsdal, 1900. Erected several new telegraphic plants in Norway, 1893–1904. Went to Iceland on an inspection, 1905, and in 1906 he constructed the telegraphic line from Reykjavik to Seydisfiord. Superintended the erection of stations and organisation of the telegraphic system in Iceland. Director of Telegraphs in Iceland, 1907, and controls both the wired and wireless nexus of the island. Member of the Engineers' Association of Iceland. Knight of Dannebrog, 1907. Address: Director of Telegraphs, Reykjavik, Iceland.

Fortescue, Cecil L., Professor of Physics, Royal Naval College, Greenwich, since January, 1911.—B. January 15th, 1881. Educ. Oundle

School and Christ's College, Cambridge, First-class Honours, Mechanical Sciences Tripos, 1903. Engineering training with Messrs. Siemens Dynamo Co., Stafford, 1903-06. Civilian Instructor in Applied Mechanics and Electro-Technics at H.M. Gunnery and Torpedo Schools, Portsmouth, October, 1906. During the war attached to Wireless Telegraphy Department, H.M.S. "Vernon," and at H.M. Signal School, Portsmouth. Member of Institution of Electrical Engineers, serving on Committee of Wireless Section of that Institution. Fellow of the Institute of Physics. Member of the Physical Society of London, serving on the Council. Member of Sub-Committee "D" on Thermionic Valves of Radio Research Board, of the Department of Scientific and Industrial Research. Address: Royal Naval College, Greenwich, S.E.10.

Franklin, Charles Samuel.—B. 1879. Received engineering and scientific training at Finsbury Technical College, under Professor Sylvanus Thompson. After some time spent in electrical work, first at Manchester and afterwards with the Norwich Electricity Company, joined Marconi's Wireless Telegraph Company (then known as the "Wireless Telegraph and Signal Company"), 1899, and still remains in their service. He has during recent years been engaged in conducting experimental and research work on behalf of Senatore Marconi, and has a number of important patents to his credit.

Frey, Emile, Swiss politician.—B. 1838, Arlesheim. Visited United States, and took part in American Civil War (1861-1865), serving with the Northern (or Federal) Army. Returned to Switzerland, 1865. Member of the National Council, 1872-1882, of which he was Chairman from 1875 to 1876. Swiss Minister Plenipotentiary at Washington, 1882-88. Member of the Federal Council, 1890, Vice-President, 1893. President of Swiss Confederation, 1894. Resigned from the Federal Council, 1897. Director of the International Bureau of the Telegraph Union from 1897, and of the Radiotelegraphic Union since 1910 until 1921. Address: Col. Frey, Arlesheim, near Basel.

Frouin, M.—Director of French Telegraphs, one of his country's representatives at the International Radiotelegraphic Conference, London, 1912.

Gardiner, B. C.—B. February 25th, 1879. Son of Rev. Canon W. Gardiner, B.D., of St. Albans Priory, Wallingford. Educ. at Marlborough College, Member of Institute of Electrical Engineers (M.I.E.E.), Brevet Lieut.-Colonel, Companion of the Order of the Bath (C.B.). Joined Royal Marines 1897. Supervised the erection of Bermuda Wireless Station 1907. Senior Instructor of Wireless Telegraphy at the Royal Naval Electrical School, H.M.S. Vernon, 1910. Attached R.E. as the Instructor of Wireless Telegraphy at the Army School of Military Engineering, Chatham, 1913. Wireless officer on the staff of Lord Jellicoe 1914-1916. Fleet wireless officer on the staff of Earl Beatty 1916-1918. Head of the Wireless Telegraphy Board 1920. Admiralty representative at the Allied Conference on Electrical Communications at Washington 1920 and at Paris 1921. Address: 24a, West Cromwell Road, S.W.5.

Gentil, Captain Antonio Alves Soares Branco, Member of Technical Committee of Portuguese Naval Wireless Telegraphy.—B. March 7th, 1874. Educ. at the Polytechnic and Naval Schools. Between 1893 and 1909 filled various Naval posts in Angola and Mozambique. Qualified as Torpedo Operating Officer at the Torpedoes and Electricity School of Val de Zebro in 1909; appointed Instructor of Wireless Telegraphy at the same school in 1911. Qualified as Submarine Commander in 1915. In 1916 became member of the Technical Committee of Naval Wireless Telegraphy appointed to investigate and make recommendations concerning wireless in all Portuguese Colonies. Appointed the Naval Staff, August, 1918. Address: Majoria General d'Armada-Estado Maior Naval, Lisbon.

Girardeau, Emile, Managing Director, Société Française Radio-Electrique and Cie Gle de Télégraphie sans Fil. Director of the Cie d'Exploitation Radio-Electrique and the Cie Radio France.—B. 1882. Educ. Ecole Polytechnique. Joined the Army and served as an officer in the Engineers. Author of various works on a number of subjects relating to wireless telegraphy. Played an important part in the creation and organisation of the Société Française Radio-Electrique, of which he is the founder. He is a Member of Légion d'Honneur.

Glazebrook, Sir Richard Tetley, Kt., K.C.B., M.A., D.Sc., F.R.S.—B. Liverpool, Sept. 18th, 1854. Educ. Trinity College, Cambridge. Fifth Wrangler. Studied Physics as Graduate at the Cavendish Laboratory, Cambridge, under Clerk Maxwell and Lord Rayleigh. Fellow of Trinity College, Cambridge (1877). Principal of University College, Liverpool (1898–99). First Director of the National Physical Laboratory (1899–1919). Chairman of the Aeronautical Research Committee. Zaharoff Professor of Aviation and Director of the School of Aeronautics, Imperial College. Past President of the Institute of Electrical Engineers. Medal of the Royal Society of Arts (1918). Member of Technical Committee inquiring into Imperial Wireless scheme. Publications: Numerous works on Physical Optics, Laws and Properties of Matter, text-books on Heat, Light, Mechanics and Electricity, as well as numerous papers in Scientific and Technical Journals. Address: Coton End, 63, Grange Road, Cambridge.

Gold, Lieut.-Col. E., D.S.O., F.R.S., Assistant Director of Meteorological Office; President International Commission for Weather Telegraphy.—B. Berkswell, Warwickshire, July, 1881. Educ. King Henry VIII's Grammar School, Coleshill; Sir Josiah Mason's College, Birmingham; St. John's College, Cambridge. (Third Wrangler, 1903.) Part II Natural Science Tripos, 1904. Lecturer in Mathematics, City of London College, Moorfields, 1904; Fellow St. John's College, Cambridge, 1906; Superintendent, Instruments Division, Meteorological Office, 1906; First Schuster Reader in Dynamical Meteorology (1907); Superintendent of Statistics, Meteorological Office (1910). Gazetted Capt., June, 1915, and attached G.H.Q. as Meteorologist to R.F.C. D.S.O. for services in Battle of Loos, and promoted Major. Appointed to command of new Meteorological Section, R.E. Mentioned in dispatches five times; promoted Lieut.-Col., March, 1918. Represented British meteorology in Aeronautical Convention at Peace Conference, 1919. Research: Identification of negative "ions" in flames with "electrons" (1905); relation between barometric pressure and wind velocity (1906); atmospheric radiation (1907). Publications: Report on existing state of knowledge of upper atmosphere (read British Association, 1909); "International Kite and Balloon Ascents" (1911). Address: 8, Hurst Close, Bigwood Road, London, N.W. 11. Tel. Finchley 1209.

Goldschmidt, Professor Dr. Rudolf.—B. March 19th, 1876, at Neu-Bukow, Mecklenburg, Germany. Educ. Wismar Municipal School. Studied engineering at Charlottenburg and Darmstadt Technical High School. Engineer in the laboratory of the A.E.G. in Berlin, 1900. Chief laboratory engineer and designer in Prague, 1901–02. Chief engineer and designer at Cromptons and Co., Ltd., Chelmsford, 1902–05; similar position with Brit. Westinghouse El. and Man. Co., Manchester, 1905–07. Lecturer at Darmstadt Technical College, 1907. Here he practised as a consulting engineer, and also pursued the development of several inventions, chiefly occupying himself with the invention and design of high-frequency alternators for wireless telegraphy. Established (1911) two large wireless stations at Eilvese, Province of Hanover, and Tuckerton, New Jersey, U.S.A., for wireless communication between Germany and America. Address: Berlin-Westend, 45, Lindenallee, Berlin.

Goldsmith, Prof. Alfred N., B.Sc., Ph.D.—B. New York City. Graduated from the College of the City of New York and Columbia University. Author of "Elements of Physics," "The Transmission of Canal Rays through Thin Partitions," "Radio Engineering at the College of the City of New York," "The Engineering Measurements of Radiotelegraphy," "Radiotelephony," and other works. Research worker in radio communication, and particularly in radiotelephony. Director of Radio Engineering Laboratory at the College of the City of New York. Editor of the "Proceedings of the Institute of Radio Engineers," Chairman of the Standardisation Committee of the Institute of Radio Engineers (1915), Secretary of the Institute (1918–20), and Member of Board of Direction of the Institute. Fellow of the Institute of Radio Engineers, Fellow of the American Institute of Electrical Engineers, Member of the American Physical Society. During 1917–18 Technical Director of the U.S. Signal Corps School of Radio and Multiplex Telegraphy, New York, besides being associated with the U.S. Naval Radio Compass School. Director of the Research Department of the Radio Corporation of America, and for the Pan-American Wireless Telegraph and Telephone Co. Address: The College of the City of New York.

Gottwaldt, Commander B. L., late Inspector of W/T, Norwegian Navy Department. Manager, Norwegian Wireless Company (Norsk Marconikompani).—B. Christiania, 1880, entered Naval Academy, Norwegian Navy, 1898. Graduated sub-lieutenant, 1901. Attended the Military Academy of the Royal Navy, 1901–04, afterwards the Technical College, Charlottenburg, Berlin. At the latter studied electrical engineering, telegraphy, telephony, and wireless telegraphy. Visited (1906) England on behalf of the Norwegian Admiralty to attend to some special work with Messrs. Armstrong, Whitworth Co., Newcastle-on-Tyne. Returned to Norway and placed in charge of W/T in the Royal Norwegian Navy, where he was responsible for the erection of naval, land and ship stations. Appointed Commander, 1912. Entrusted with the control and test of wireless apparatus ordered in England and Germany by the Norwegian Government. One of the Norwegian delegates at the International Radio Conference in London, 1912. He has written a number of articles, and three books on wireless. Address: 15, Baldersgate, Kristiania.

Gray, Andrew, A.G.T.C., Assoc. M.Inst.C.E., M.I.E.E., Chief Engineer of the Marconi Parent Company (since 1910).—B. Glasgow, 1873. Educ. Glasgow University; Royal Technical College. Diploma of latter in electrical engineering. Served as assistant to late Professor Andrew Jamieson, of Royal Technical College. Joined the West India and Panama Telegraph Company, Ltd. (1893), serving respectively as assistant electrician, chief electrician, and telegraph engineer. Entered Marconi Company, 1899. Introduced Marconi system to Hawaiian Islands. Organised telegraph working and training of native operators of Inter-island Telegraph Company of Honolulu. Appointed Chief of Staff to the Marconi Companies in 1901, and in that capacity organised the working of the ship and shore wireless service, designed the original 1½ kw. Ship Set, and supervised the ship and shore operating until 1906, when the engineering and traffic work were separated. Address: 78, Creffield Road, Acton, W.3..

Grenfell, Wing Commander George Pascoe, D.S.O. (1917).—B. 1883. Educ. privately. Successively on staffs of Eastern Telegraph Co., Ltd.; Amalgamated Radio Telegraph Co., Ltd. (De Forest & Poulsen Systems): British Radio Telegraph Co., Ltd. Went overseas 1915 in charge of Wireless in R.F.C., Middle East. Served in Egypt, Senussi campaign, and Salonika. Transferred to H.Q. Staff—R.F.C., B.E.F., France, end of 1916. In charge of W/T (Communications and Artillery Co-operation). Mentioned in dispatches, 1917. Returned to England and joined Staff of Director of Air Organisation, Air Ministry, as S.O. 1, June, 1918. Appointed member of W/T Board, June, 1918. Took command of W/T Experimental Establishment, Biggin Hill, December, 1918. Address: R.A.F., Biggin Hill, Kent.

Hammond, John Hays, Jr.—B. San Francisco, April 13th, 1888. Educ. Preparatory Schools in England and the U.S. Graduated from the Yale-Sheffield Scientific School, 1910. Working ever since on the development of the system of radio control of torpedoes and other moving bodies. Originator of the system of aerocoastal patrol, comprising aeroplanes equipped with wireless, which received the endorsement of President Wilson, the Secretary of Navy, and the Secretary of War. Author of a four-volume treatise on the Art of Teledynamics. Treasurer of the Institute of Radio Engineers, and Manager and Chairman of the Committee on Admissions. Associate Member of the American Society of Mechanical Engineers. Delegate to the London International Radio Telegraphic Conference, 1912. Member of the American Institute of Electrical Engineers. Received honorary degree of Doctor of Science at George Washington University, June, 1919. Invented system of aerial radio surveying and mapping, which has been adopted by the Bartlett Expedition for Polar Basin surveying. Inventor of thermite incendiary shell, testing by Bureau of Ordnance, War Department. Inventor of the Radiodynamic Torpedo, testing by U.S. War Department. Address: Hammond Radio Research Laboratory, Gloucester, Mass.

Harrison, Lieut.-Col. Norman, C.M.G., D.S.O., M.I.E.E.—B. 1873. Educ. in Natal. Served in South African War, and European War, 1914–19, as Director of Army Signals in German South-West Africa, and as Assistant Director of Army Signals, and Commanding South African Signal Units (attached to Corps of Royal Engineers) in France, 1916–19. Engineer-in-Chief of Posts and Telegraphs, Union of South Africa since 1910. Addresses: (1) G.P.O., Pretoria; (2) Pretoria Club, Pretoria; (3) Civil Service Club, Capetown.

Hogan, John V. L.—B. Philadelphia, Pa., U.S.A. Educ. Scientific School of Yale University, specialising in physics and mathematics. Assisted Dr. Lee De Forest in his work on experimental Radiotelephony, and in the development of the grid audion, 1906 and 1907. Joined the staff of the National Electric Signalling Company at Brant Rock, Mass., 1909. Appointed Chief Research Engineer of that Company, 1914. In 1917 the Company changed its name to the "International Radio Telegraph Co.," and in 1918 he was appointed manager. Author of "The Heterodyne Receiving System," "Wireless Telegraphy in Railroad Service," "Transatlantic Radiotelegraphy," and numerous other articles and papers published in the Proceedings of the Institute of Radio Engineers, the "Electrician" (London), the "Electrical World," the "Jahrbuch der D.T.U.T.," etc. Fellow of the Institute of Radio Engineers, and Vice-President since 1916. Member of the American Association for the Advancement of Science, of the American Institute of Electrical Engineers, and honorary member of the Radio Club of America. Chairman of the Standardisation Committee of the Institute of Radio Engineers since 1916. He is the holder of a number of patents embodying inventions relating to radiotelegraphy, and has been identified with important patent litigation as principal technical witness. Address: C/o International Radio Telegraph Co., 326, Broadway, New York, U.S.A.

Holmstroem, J. Gunnar, Director of Radiotelegraphic Instruction, Stockholm, Kt. of "Vasa" Order.—B. Stockholm, April 23rd, 1874. Passed through Poly. Acad., Stockholm, 1896. Assistant Royal Swedish Telegraph Dept., 1892. Teacher at Swedish Artillery and Engineers' College, 1904, and College for Naval Officers, 1908. Head of the Telegraph Department's School, 1902. Publications: "Lärobok in Telegrafi," 1914, and "Handbok i Radiotelegrafi," Stockholm, 1908. Address: Malmskillnadsgatan 19 B, Stockholm.

Hooper, Commander Stanford C., United States Navy.—In charge of Radio material, construction, supply and development in the Bureau of Engineering attached to the U.S. Navy. B. August 16th, 1884, Colton, Cal. Educ. at San Bernardino, California. Started his career as telegraph operator in the Southern Pacific Company, afterwards transferring to the Postal Telegraph Company. Entered the Naval Academy, Annapolis, Md., September 6th, 1901. Graduated January 31st, 1905. Served as midshipman on the cruiser "Chicago," destroyer "Perry," and monitor "Wyoming," and later on various ships as ensign, 1907, lieutenant, 1910, lieutenant-commander, 1915, commander, 1918. Instructor of electrical engineering, physics, and chemistry at the U.S. Naval Academy, 1910-11. Fleet Radio Officer of the United States Atlantic Fleet, 1912-13, taking part in the capture of Vera Cruz, Mexico. Early in the war acted as observer in Europe. In charge of the Radio Division Bureau of Steam Engineering, Navy Department, 1915-17. Commanded the destroyer "Fairfax" in the Atlantic during 1917-18, then returned to take up duties in the Navy Department, 1918. Address: Navy Dept., Washington, U.S.A.

Hope-Jones, Frank, Chairman, Wireless Society of London.—B. 1867. From 1890 to 1895 associated with his elder brother, Robert Hope-Jones, in some of his earliest applications of electricity to organ-building. Has established the business of electric time service on a scientific basis. Member of the Institution of Electrical Engineers and the British Horological Institution. Author of numerous contributions to technical journals and to the Proceedings of Scientific Societies. Address: 32 and 34, Clerkenwell Road, E.C.1.

Howe, Prof. George William Osborn, D.Sc., M.I.E.E.—B. 1875, Charlton, Kent. Educ. the Roan School, Greenwich, Woolwich Polytechnic, Durham University. Nine years with Siemens Bros., at Woolwich, and Siemens and Halske, at Charlottenburg. Two years lecturer at Hull Technical School. Lecturer and later Assistant Professor of Electrical Engineering at the City and Guilds Engineering College, which forms the engineering section of the Imperial College of Science and Technology at South Kensington. D.Sc. of Durham, hon. D.Sc. of Adelaide University. Whitworth Scholar. Has read several papers on Radiotelegraphy before the Royal Society, the British Association, the Physical Society, etc. Awarded the silver medal by the Royal Society of Arts (1912) for his paper on "Some Recent Developments in Wireless Telegraphy." Fellow of the Physical Society. Member of the Radio Research Board and of the Radiotelegraphic Research Committee of the British Association. Chairman of the Wireless Section of the Institution of Electrical Engineers. Head of the Department of Electric Standards and Electric Measurements at the National Physical Laboratory, 1921. Appointed in the same year to the James Watt Chair of Electrical Engineering in the University of Glasgow. Editor *Radio Review*. Address: National Physical Laboratory, Teddington.

Hoyle, Lieut. Bertram, M.Sc. (Tech.), Assistant Lecturer, Victoria University and College of Technology, Manchester.—B. Oldham. Educ. College of Technology, Manchester (of which he is now an Associate), and at the Victoria University, Manchester. In 1907 he obtained the Certificate and Diploma in Technology and M.Sc. (Tech.) of Victoria University. Served with Messrs. Henry Simon, Ltd., Manchester, and with Messrs. S. Z. de Ferranti, Ltd., Hollinwood. Assistant Lecturer and Demonstrator in Electrical Engineering at the College of Technology, Manchester, 1911. Had charge of the design and erection of the wireless station with which the School of Technology is equipped. Enlisted early in 1915 as a motor cycle despatch rider, and served on the Western Front. In September, 1915, gazetted Lieut. R.N.V.R. Author of "Standard Tables and Equations." and a number of technical essays and monographs. Address: 18, King's Drive, Heaton Moor, near Stockport.

Isaacs, Godfrey C.—Educ. England, France, and Germany. Began life in his father's business, and a few years later was manager. Managing Director of Marconi's Wireless Telegraph Co., Ltd., and the Marconi International Marine Communication Co., Ltd., 1910. Address: Lyne Grove, Virginia Water, Surrey.

Isbell, Arthur A., General Superintendent, Pacific Division, Radio Corporation of America, San Francisco. Started in telegraph business in 1893, as a messenger for the Western Union Telegraph Company at North Adams, Mass., U.S.A. Entered service of original De Forest Wireless Telegraph Company, New York, in 1902. Later associated with Professor R. A. Fessenden for three years in numerous experiments in U.S.A. and Scotland. First merchant marine radio operator in the Pacific Ocean on steamer "President," in 1907. In 1908 built semi-high power station in Hawaiian Islands, and established first wireless communication

between the Islands and the mainland of United States. In 1910 erected first wireless station at Wellington, New Zealand. Division Superintendent, United Wireless Telegraph Company, New Orleans and San Francisco. Built Alaskan Circuit for Marconi Wireless Telegraph Company of America. 1917-1918, Expert Radio Aid, Navy Department, Washington, D.C.

Jackson, Admiral of the Fleet Sir Henry Bradwardine, G.C.B., K.C.V.O., D.Sc., LL.D., F.R.S., M.I.E.E.—B. Barnsley, January 21st, 1855. Entered Royal Navy December, 1868. Capt. 1896; Rear Admiral 1906; Controller of Navy 1905-08; Commanded 6th Cruiser Squadron 1908-10; Chief of Naval War Staff 1912-14; First Sea Lord May, 1915-December, 1916; President R.N. College, Greenwich, 1917-19. Hon. Vice-President of Inst. of Naval Architects. Vice-President of Wireless Society of London. Chairman of Radio Research Board 1920. Hon. D.Sc. Leeds and LL.D. Cantab. Whilst Commander of H.M.S. "Edinburgh," in 1893, conceived the idea of using Hertzian Waves for Naval signalling purposes, especially in connection with torpedo boat work, experimented intermittently in this direction by exciting a circuit which included a filings coherer tapped by the hammer of a high-resistance trembling bell. Continued to take much interest in the development of W/T, and assisted in its organisation in the Navy. Address: 37, Catherine Street, London, S.W.1.

Janet, Paul, Membre de l'Institut. Professor of Physics, University of Paris, Director of the Central Laboratory and of the High School of Electricity.—B. January 10th, 1863, in Paris. Studied at the Lycée Louis-le-Grand and the High School. Member of the French Society of Physics, the International Society of Electricians, and the Society of Civil Engineers of France. Professor of Physics at the University of Grenoble, 1886-94. Author of several important works. First to make a successful experiment in electric resonance by means of high-frequency currents, 1892; this is the phenomenon used to-day in wavemeters.

Jenner, Axel.—B. 1885. Student 1904. Assistant at the Swedish Telegraph Service 1905. Passed the course for superintendents of the wireless stations 1916. Since 1916 superintendent of the wireless station at Boden, Sweden. Address: Boden, Sweden.

Jotikasatira Hang, Chief of the Wireless Department of the Naval General Staff, Siam.—B. at Bangkok, September 27th, 1876. Educ. at Bangkok and at Penang. In 1890 he was sent to Europe to be educated as an engineer. He studied seven years at Erfurt, and entered the Technische Hochschule at Hanover in 1897. On passing the final examination of that school in 1902, he returned to Siam and joined the Siamese Navy as an Engineer-Lieutenant. 1907-12, an instructor in the Naval Cadet School. Awarded the title of Luang Nava Vichitr, 1911. Joined the Naval General Staff as the Chief of the Wireless Department, 1912. Promoted Commander 1918. Awarded the title of Phra Vidyu Düralikhit 1920. Address: Bangkok.

Kadōka, Hayao.—B. Tokyo, March, 1883. Graduated from the Tokyo Imperial University, July, 1906. Studied at the Earthquake Investigation Committee in the Dept. of Education, November, 1908. Lecturer at the Science College of the Tokyo Imperial University, March, 1909. Served in the Army, for researches on radiotelegraphy. Proceeded to Europe and America for inspection of the war-time condition of radiotelegraphy, 1917-1918. Since 1911 designed several radio stations. Address: 114, Sanya Yoyogi, Tokyo.

Kajima, Akira.—B. Tokyo, 1883. Graduated from the Greek Catholic Mission School, Tokyo, 1904, and became publisher of a religious magazine. Interpreter at the French Embassy from 1905 to 1906. Received a medal in recognition of distinguished services. Joined the editorial staff of the *Chuo Shimbun* in 1906, and that of the *Kokumin Shimbun* in 1908. Established the Japanese Wireless Press Agency in 1911 and the Nippon Radio Apparatus Manufacturing Company, 1915, which was converted to the Nippon Radio Telegraphy and Telephony Co., Ltd., 1920, and became the Managing Director the same year. Retired 1921. Started a monthly magazine named *Musen no Nippon* or Wireless Press in 1918. Private residence: 16, Kobinata-Daimachi 1 chome, Koishikawa, Tokyo.

Kennedy, Sir A. B. W., F.R.S.—B. London, March 17th, 1847. He has had great mechanical engineering experience. Some time President of the Institution of Civil Engineers, and the Institution of Mechanical Engineers. Professor of Engineering at University College, London, 1874-89, and founded there the first "Engineering Laboratory." Designed electric lighting and power stations for many companies and corporations, and has also been engaged in railway and constructive work. Knighted 1905 for his services to the Admiralty. Member of the Technical Committee appointed by the Postmaster-General to consider the Imperial Wireless Scheme. Civilian Member of the Ordnance Committee. During the War was Member of the Munitions Inventions Panel, and Vice-chairman of the Anti-Aircraft Equipment Committee (Ministry of Munitions). Consulting Electrical Engineer to the L.N.W.R., L.S.W.R., and the London County Council. Chairman of the Electn. of Railways Advisory Committee (Ministry of Transport). Address: A7, The Albany, Piccadilly.

Kennelly, A. E.—B. Colaba, Bombay, December 17th, 1861. Educ. in England, Scotland, Belgium, France and Italy. Past-President of the American Institute of Electrical Engineers, Past-President of the American Association of Illuminating Engineers; President, in 1916, of the Institute of Radio Engineers; Vice-President of the International Electrical Congresses, Paris and Turin; General Secretary of the Congress at St. Louis, Mo., U.S.A. Left school in 1875 to become a telegraph operator in the Eastern Telegraph Company. Chief Electrician on Cable Ship, 1881; Senior Electrician ship staff, E.T.C., 1886. Principal electrical assistant to Thomas A. Edison, in the laboratories at Orange, N.J., 1886-92. Consulting Engineer in Philadelphia. In partnership with E. J. Houston, of the Thomson-Houston Company, 1893-1900. Engineer-in-Chief when the cables were laid from Vera Cruz to Campeche, 1902. Professor of Electrical Engineering at Harvard University and also at Massachusetts Institute of Technology, since 1914. Corresponding Fellow of the British Association for the Advancement of Science; Honorary Member of the Institution of Electrical Engineers of London, and has twice received one of its premiums for papers. Director of Research Division of the Electrical Engineering Department, Massachusetts Institute of Technology, and Fellow of the American Academy of Arts and Sciences. He has written twenty-three books as author or collaborator, one of which is

considered a standard elementary exposition of wireless telegraphy, and is author of more than 120 scientific papers. Honorary degrees include the S.D. of University of Pittsburg and A.M. degree of Harvard University. Some time Chairman and Secretary of Standards Committee, American Institute of Electrical Engineers, President and Secretary of the American Committee of the International Electro-Technical Commission. On duty as exchange Professor in French Universities, 1921-22. Member National Ac. Sciences. A delegate to the Inter-allied Radiotechnical Committee in Paris, 1921. Has specialised in alternating currents. Address: c/o Morgan-Harjes & Co., 14, Place Vendôme, Paris, 1e.

Kilt, A. A.—B. London, 1881. Educ. City of London School and Finsbury Technical College. Joined Marconi Company, 1902. Acted as erecting engineer supervising the installation of many of the earlier ship stations, including those on board the first vessels of the White Star fleet to be equipped. In charge of the installation of the Post Office Wireless Stations at Lochboisdale, Tobermory and Bolt Head. Appointed Chief of the Estimating Department of Marconi's Wireless Telegraph Company, 1911.

Kimura, Shunkichi, Ph.D.—B. 1866. Graduated Scientific College of the Tokyo Imperial University, in the department of Physics, 1888. Lecturer of the First High School in Tokyo. Studied Mathematical Physics in Harvard and Yale Universities 1893-95. Received the degree of Ph.D. (Yale), 1895. Member of Sigma Xi Society. Visited Holland, Co-founder with Dr. Molenbroek, assisted by Professor Tait, of Edinburgh, and Dr. Joly, of Dublin, of the Association for Promoting the Study of Quarternions and Allied Subjects. Returned to Japan. Professor of the Second High School in Sendai. Transferred to the Imperial Japanese Navy, 1901, to investigate wireless telegraphy for naval use. Invested with Order of Rising Sun (5th Class), 1903. Invested with Order of Rising Sun (3rd Class) with annuity, 1906. Fellow of the Royal Society of Arts, 1906. Japanese delegate to the International Wireless Telegraph Conference, Berlin, 1906. Retired from the Navy, 1912. Patent Attorney, with office at the Mitsui Building, Honkawayacho, Nihonbashi, Tokyo. Director of various companies, including the Nippon Radio Telegraph and Telephone Company. Engaged in the successful litigation of the General Electric Company against some Japanese firms for infringement of the patents with respect to ductile tungsten. Author of several papers on wireless telegraphy. Address: Momosono, Nakano, Tokyo.

Kojima, Kiyoshi.—B. Tokyo, January, 1889. Graduated from the Science College of the Kyushu Imperial University, July, 1915. Entered the service of the Department of Communications and engaged in scientific researches at the Electrical Laboratory under Dr. Wichi Torikata. Joined Nippon Radio Apparatus Manufacturing Company as chief of Engineering Department, April, 1916, and became a director when the above company was changed to the Nippon Radiotelegraphy and Telephony Co., Ltd., 1920. Address: 1280 Shimo-Shibuya, suburb of Tokyo.

Kolster, Frederick A.—B. Geneva, Switzerland, January 13th, 1883. Educ. Public Schools of Cambridge, Mass., and at Harvard University. Assistant to John Stone Stone 1902-08. Took an active part in wireless engineering up to 1912. Joined the scientific staff of the U.S. Bureau of Standards, 1912, and has been closely associated with the radio work of the U.S. Government. Research Engineer, Federal Telegraph Co. Inventor of a direct reading decremeter, directional radio systems, and other devices. Fellow of the Institute of Radio Engineers. Attaché to American delegation representing the U.S. at London International Radio Convention in 1912. Member American Institute of Electrical Engineers. Member Cosmos Club, Washington, D.C.; Engineers Club, San Francisco, Cal. Address: c/o Federal Telegraph Co., Palo Alto, California, U.S.A.

Koomans, Nicolaas.—B. December 18th, 1879, at Delft. Studied at Delft for mechanical and electro-technical engineer, obtaining his certificate, 1901. For one year assistant in applied geometry, and for one and a half years in physics and electrical engineering at the Technical High School at Delft. Entered the Government Telegraph Service. Grad. 1908 at Technical High School at Delft as Doctor in Technical Sciences on the strength of a dissertation "Regarding the Influence of Self-Induction in Telephone Conducting Wires," containing theses in which are laid down the results of, and the conclusions from, experiments and measurements on Pupin cables of the Dutch telegraph administration. Joint-founder and editor of the Monthly Review of Telephony and Telegraphy. Joint-founder and member of the managing board of the Dutch Society for Radiotelegraphy (Nederlandsche Vereeniging voor Radiotelegrafie). Member of the International Electro-technical Commission. Professor in Physics and Theoretical Electrical Engineering at the school of the Dutch Post and Telegraph Administration. Supervises the instruction of all the higher officials. Address: Antonie Duyckstraat 24, The Hague, Holland.

Korn, Professor Arthur.—Professor at Polytechnical High School, Charlottenburg, Berlin. B. Breslau, Germany, May 20th, 1870. Studied at Leipsic and Paris in Mathematics and Physics. Professor of Physics, University of Munich, 1903-08. Best known as the inventor of a system of telegraphic transmission of photographs, an in 1907 the first photograph was transmitted under his system from Munich to Berlin, a distance of 600 kilometres. Inventor of a system of telautography and wireless phototelegraphy. Author of "Elektrische Fernphotographie und Aehnliches," Leipsic, 1904, and "Handbuch der Phototelegraphie und Telautographie," published in 1911 in collaboration with Dr. Glatzel. Address: Charlottenburg, Berlin Schluterstrasse 25.

Koto, Major-General, Teizo, Military Engineer.—B. Yamaguchi prefecture, May, 1873. Entered the military service as cadet in the 6th Engineering Battalion, 1892, and promoted to 1st Lieutenant, May, 1898. Entered the Science College of the Tokyo Imperial University as a special student of the School of Artillery and Engineering, 1900, and graduated therefrom 1903. Served in the Russo-Japanese War as the chief of the Field Telegraphy Corps, 1904. Promoted Major and appointed an inspector of the Military Technical Dept., 1905. Promoted Lieut.-Major and appointed Member of the Military Wireless Investigation Committee, 1910. Proceeded to China for the erection of a radio station on Chinwangtao Island, 1912. Promoted Colonel and Chief of the Communications Dept. of the Tsingtau Garrison, 1915. Engaged in the erection of radio stations at Hankow and Tsinan. Promoted Major-General and Military Engineer, 1919. Address: 68, Tani-Machi, Ichigaya, Ushigome, Tokyo.

Krarup, T. F., Knight of Dannebrog.—B. Copenhagen, August 16th, 1868. Student 1885. Young lawyer 1891. Head clerk to Criminal Judge at Frederiksberg, 1891. Assistant in the Ministry of Home Affairs, 1894. Assistant to Copenhagen Harbour Administration, 1896-1907. Head clerk to Ministry of Public Works 1904; Chief from 1912. Vice-President of the Electricity Commission, 1907; Chairman from 1916. Chairman of the Cement Commission, 1917. Member and Secretary of the Telephone Commission of 1917, from 1917; Chairman from 1920. Chairman of the "Gudenaa" Commission and the other Commissions concerning water power plants 1918, and of the Commission regarding Long Distance Radio Telegraph Stations. Address: Frederiksberg Allé 55, Copenhagen V, Denmark.

Kroger, F. H.—Educ. University of Colorado. Graduated M.S. 1905. Apprenticed to the Westinghouse Electric and Manufacturing Co., East Pittsburg, 1905. Engineer at Brant Rock Transatlantic station of the National Electric Signalling Co., 1906. Radiotelegraph Adviser to the States Signal Corps (1907), which installed the Inland Radio Station in Alaska. Organised educational courses in electrical engineering and in radiotelegraphy at Cornell University, 1908-11. Joined the International Radiotelegraph Company, New York, 1911. Joined the Marconi Wireless Telegraph Company of America (1919) as division engineer at their factory. Joined staff Radio Corporation of America, 1920. Address: 54, Martense Street, Brooklyn, New York.

Kujirai, Tsunetaro, Professor of the Tokyo Imperial University.—B. 1882. Graduated Electrical College of Tokyo Imperial University, 1907. Some time Wireless Engineer in the Department of Communications, and Assistant Professor of the Tokyo Imperial University. Awarded the Academy prize and medal of the Japanese Imperial Academy. Member of the Institute of Physical and Chemical Research. Address: Tokyo Imperial University, Hongo, Tokyo, Japan.

Langmuir, Dr. Irving, M.A., Ph.D. of University of Gottingen (1906).—B. Brooklyn, New York, January 31st, 1881. Educ. School of Mines, Colombia University; Graduated 1903 as metallurgical engineer. Undertook post graduate work at University of Gottingen under Professor Nernst. Returned to America and became Instructor in Chemistry at the Stevens Institute of Technology, 1906-09. Entered Research Laboratory of G.E.C. at Schenectady, 1909, where his investigations have included Radio Telephone and Telegraphic Apparatus, Tungsten Lamps, Electric Heating Devices, Pure Electron Discharge Apparatus, Atomic and Molecular Structure, etc. During the war engaged on submarine problem and developed several successful detecting devices used by the United States Navy. Has been a frequent contributor to various scientific journals and published many scientific works. Addresses: G.E C. Research Laboratory, Schenectady, New York. 6, Stratford Road, Schenectady, New York.

Latour, Marius.—B. October, 1875, in South-western District of France. Educ. University of Paris and Ecole Supérieure d'Electricité, Paris. For many years consulting Engineer to the General Electric Company of America. Has identified his name with numerous inventions in various domains of science, including improvements to the helicopter, submarine signalling, and notably in dynamo-electrical machinery. Paid special attention to the construction of high-frequency machines, which he originally attempted to design in the shape of monophase or polyphase machines grouped in cascade. Analysed the essential features of machines based on this principle, and showed their analogy and close relationship to those of Professor Goldschmidt. Designed the H.F. alternator with reduced number of stator slots known as the S.F.R. alternator installed at numerous stations, including Lyons and Coltano. Presented an original paper to the Technical Manager of the General Electric Company at Schenectady in 1904, setting forth the principle of the reception of continuous waves by beats, and this method of C.W. reception is to-day in general use. Systematically studied the triode valve and originally propounded the four determining derivatives thereof. During the war engaged in research work at the laboratories of the Etablissement Central de la Télégraphie Militaire under General Ferrié. His system of elimination of the interference produced in telephone lines by neighbouring H.T. power lines has been installed throughout the whole of Northern France. Originally suggested and patented the system, now widely used, of H.F. multiplex telegraphy and telephony using triode valves for generation and reception. Has specialised in the development of high and low-frequency valve amplifiers for the Société Française Radio-Electrique, of which he is Consulting Engineer. Chevalier de la Légion d'Honneur. Vice-President of the Société Française des Electriciens. Member of the American Institute of Electrical Engineers. Member of the Institute of Radio Engineers. Head Lecturer at the Ecole Supérieure d'Electricité. Address: 8, Square Desaix, Paris, XVe. Telephone: Saxe 85-88.

Lippmann, Gabriel.—Of the Académie des Sciences at the Bureau des Longitudes. Commander of the Legion of Honour. Director of Laboratory of the Ecole des Hautes-Etudes. Professor at the Sorbonne. President of the Interministerial Commission on Wireless Telegraphy. Occupied primarily with electrical matters. Inventor of an apparatus employed in Military Wireless Telegraphy for receiving Wireless Time Signals. Foreign Member of the Royal Society of London. Address: Sous-Secrétariat d'Etat des Postes et Telegraphes, Paris.

Litström, Axle Sigurd.—B. Falun, Dalecarlia, September 3rd, 1881. Passed Mautority Examination 1900. Examination of Electro-Technical Branch, Technical University, Stockholm, 1905. Entered the Telegraph Service, 1900. Inspector of wireless installations, 1913. Chief Engineer at the Radio Division of the Royal Telegraph Administration, Stockholm, 1920.

Ljungqvist, Seth.—B. Falun, Dalecarlia, Sweden, May 5th, 1880. Passed Mautority Examination, 1899, and Examination of Electro-Technical Branch, Technical University, Stockholm, 1904. Entered the Telegraph Service, 1899. Chief of the Radio Division in the Royal Swedish Telegraph Department, Stockholm, 1916. Address: Vanadisvagen 23, Stockholm.

Lodge, Sir Oliver, D.Sc., F.R.S.—B. Penkhall, Staffs, June 12th, 1851. Educ. at Newport (Salop) Grammar School; studied privately for several years. Entered University College, London, 1873. Graduated D.Sc. 1878. Reader in natural philosophy at Bedford College for Women, and Assistant Professor of Physics in University College, London, for several years, and Professor of Physics at University College,

Liverpool, 1881-1900. The First Principal of Birmingham University, 1900. Knighted, 1902. Original investigations on lightning, the seat of the electromotive force in the voltaic cell, the phenomena of electrolysis and the speed of the ion, the motion of the ether near the earth, and electromagnetic waves and wireless telegraphy. His patent (1897) for syntonic wireless telegraphy was extended for seven years by Lord Parker, and was acquired by the Marconi Co. in 1911. Has held the position of President of the British Association, President of the Physical Society, and of the Society for Psychical Research. Has made many important contributions to the literature of science. Address: Normanton, Lake, Salisbury.

Loring, Commander F. G., R.N., M.I.E.E.—Inspector of Wireless Telegraphy, General Post Office. Entered the Navy in 1882 (retired 1910). Lieutenant on H.M.S. "Victoria" when that vessel was rammed and sunk by H.M.S. "Camperdown" off Tripoli (1893). Received Bronze Medal of Royal Humane Society for saving two lives. In charge of Admiralty shore wireless stations 1902-08. Admiralty delegate at Berlin International Conference on Wireless Telegraphy, 1906. Appointed Inspector of Wireless Telegraphy, 1908. Post Office delegate at International Conference on Wireless Telegraphy, London, 1912. Technical Adviser to the Board of Trade on Wireless matters at International Conference on Safety of Life at Sea, London, 1914. Address: The Old House, Foot's Cray, Kent.

Lyons, Colonel Henry George, D.Sc., F.R.S.—B. October 11th, 1864. Educ. Wellington College, Director-General of the Survey Department in Egypt, 1898-1909, gaining Victoria Research Medal, R. Geog. Soc., 1911. Member of the Meteorological Committee, 1913. Commandant Army Meteorological Services, during the War; Acting Director Meteorological Office, 1918-19. Chairman of Sub-Committee "B" on Atmospherics of Radio Research Board of the Department of Scientific and Industrial Research. Keeper, Science Museum, 3, Cambridge Square, W.2.

Machado, Alvaro de Melo, Commander in Portuguese Navy, and Torpedo Operating Officer of the Naval College of Val de Zebro.—B. February 22nd, 1883. Entered Portuguese Naval Service, 1904, and elected Member of the Portuguese Academy of Science for his original design of wireless-controlled torpedo in 1907. In 1915, whilst only Second Lieutenant, became Manager of the Electrical Services of the Marine Arsenal, and was responsible for the direction of the installations made in the National Naval Units and Land Stations of the Navy. Reorganised the dismantled wireless on German vessels confiscated during the war. Received Portuguese Distinguished Service Medal, and made Member of the "Académie Française" in 1917, in acknowledgment of his wireless work. Address: Ministry of Commerce, Lisbon.

Makower, A. J., M.I.E.E.—B. May 9th, 1876. Educ. University College School, Gower Street, and at the College itself, between 1884 and 1895. Studied mathematics at Trinity College, Cambridge, taking his degree, 1898. Proceeded to Technical School, Charlottenburg, Germany, and obtained valuable insight into German methods. Joined the British Thomson-Houston Company, Rugby. Received an appointment at the South-Western Polytechnic, Chelsea, 1904. As head of the Electrical Engineering Department at the Polytechnic, was closely connected with the University of London, of which he was a teacher. At one time Secretary of the Board of Studies in Electrical Engineering, and Chairman of the Board of Examiners in Electrical Engineering. Author of many valuable papers on wireless subjects. Resigned his teaching post and became managing director of Mossay & Co., Ltd., designers and selling agents for commercial electric vehicles, 1918. A member of the Electric Vehicle Committee of Great Britain. Address: 12, Greencroft Gardens, N.W.6.

Makower, Capt. W., M.A., D.Sc.—B. December 6th, 1879. Educ. University College School and University College, London. Took honours degree in Chemistry at the University of London, 1900. His early research work relates to investigations in heat, but on proceeding to Trinity College, Cambridge, 1902, commenced investigations at the Cavendish Laboratory on radio-activity. Elected to a Research Fellowship in the University of Manchester. Subsequently Assistant Director of the Physical Laboratories. Continued these researches until 1917. Joined the R.N.V.R. as a lieutenant, 1917, and subsequently became captain in the R.A.F. During the war, at the Air Ministry Laboratory in the Imperial College of Science and Technology, working on thermionic valves and other matters connected with wireless telegraphy. Since the Armistice has been engaged on various problems connected with wireless telegraphy and navigation being investigated at the Air Ministry Laboratory. Most of his scientific publications have been in connection with radio-activity, of which, perhaps, the most important are on the subject of radio-active recoil, which he discovered with Dr. S. Russ in 1909, and he was awarded the degree of D.Sc. at London as a result of his early investigations in this subject. Of his other contributions to Science are his work on the Electric State of the Upper Atmosphere and his books on *Radio-Active Substances* and *Practical Measurements in Radio-activity.* Elected a fellow of University College, London, 1912, and for some years past has acted as Recorder of Section "A" of the British Association.

Marchant, Edgar Walford, D.Sc., M.I.E.E.—David Jardine Professor of Electrical Engineering in the University of Liverpool. B. Kent, 1876. Educ. University School, Hastings, and Central Technical College. Graduated B.Sc. at London University with honours in physics and mathematics, and subsequently took the degree of D.Sc. After serving an apprenticeship appointed Superintendent of Lord Blythswood's Laboratory and Workshops at Renfrew, N.B., 1897, where he carried out many experiments in wireless telegraphy. Leaving Renfrew in 1900, served as chief assistant for one year at the Finsbury Technical College under the late Professor Silvanus P. Thompson. Lecturer in electro-technics at University College, Liverpool, 1901, and on the establishment of a Chair of Electrical Engineering in 1903 was elected the first professor. Closely associated with the late Mr. Duddell in the development of the oscillograph and joint author of a paper read before the Institution of Electrical Engineers on the study of the electric arc by the aid of oscillographs. Author of a number of articles on wireless and cognate subjects, and was one of the British delegates to the Scientific Commission on Wireless Telegraphy, held in Brussels, April, 1914. Vice-President of the Wireless Society of London, Past President of the Liverpool Engineering Society, Past Chairman of the Manchester Section of the Institution of Electrical Engineers. Address: 2, Ivanhoe Road, Sefton Road, Liverpool.

Marchant, W. H.—B. London, March 22nd, 1881. Commenced experimental work in connection with W/T (1904). From 1906-11 he served with De Forest Syndicate, Poulsen Company, and Lepel and Anglo-German W/T Companies, being chiefly engaged in experimental work. Since 1911 he has devoted himself mainly to literary work and to teaching. At present in the service of the Eastern Telegraph Co., at their London training centre. Address: 4, Branch Hill Side, Hampstead, N.W.

Marconi, Alfonso.—B. Bologna, 1865. Educ. Bedford Grammar School, England, and Technical Colleges in Florence and Leghorn. Assisted his brother in carrying out his first experiments in Wireless Telegraphy on one of his father's estates near Bologna. Joined the board of Marconi's Wireless Telegraph Company and the Marconi International Marine Communication Co., Ltd., July, 1909. Address: 75, Harley House, Regent's Park, London, N.W.1.

Marconi, Senatore Guglielmo, G.C.V.O., LL.D., D.Sc., M.I.E.E.—B. Bologna, Italy, April 25th, 1874. Irish on his mother's side. Educ. Leghorn and Bologna. First interested himself in the problem of wireless telegraphy, 1895. Visited England, 1896, and took out the first patent ever granted for a practical system of wireless telegraphy by the use of electric waves. Earliest experiments in England made at Westbourne Park. Shortly afterwards Senatore Marconi made some experiments for the Post Office officials. The Italian Government conferred upon Mr. Marconi the honour of knighthood. Senatore Marconi has been decorated by the King of Italy and the late ex-Czar of Russia, is an honorary doctor of many universities, including Oxford, Glasgow, Aberdeen, Liverpool, and Pennsylvania, besides having received the freedom of the principal Italian cities. In 1909 (in conjunction with Professor Braun) he was awarded the Nobel Prize for Physics. In 1912 he was decorated with the Grand Cross of Alfonso XII and made Grand Officer of the Order of St. Maurice and Lazarus. Elected a senator in the Italian Parliament (1914), being formally introduced to the Assembly on March 27th, 1915. On July 24th, 1914, the King bestowed upon him the Honorary Knighthood of the Grand Cross of the Victorian Order. He also holds many scientific awards granted by various societies and institutions, of which we may quote as a comparatively recent instance his presentation by the Royal Society of Arts, on April 12th, 1915, of their Albert Medal. Immediately on the declaration of war by Italy, Senatore Marconi was given the rank of Lieutenant in the Italian Army. He has been employed on important military missions to England by the Italian Government, and on July 29th, 1916, was promoted Captain "for exceptional services." At the beginning of September, 1916, he was transferred from the Italian Engineer Service to be temporary Commander in the Navy. Senatore Marconi visited the United States, 1917, as Member of the Official Mission sent by Italy to the U.S.A. Government. The University of Columbia invested him with the honorary degree of Doctor of Science on June 6th, 1917. The Franklin Institute of Philadelphia conferred their Franklin* Gold Medal upon Senatore Marconi on May 15th, 1918. On June 26th, 1919, Senatore Marconi was appointed by H.M. the King of Italy Plenipotentiary Delegate to the Peace Conference at Paris, and in this capacity he signed the Peace Treaties with Austria and Bulgaria. At the end of 1919, Senatore Marconi was awarded the Italian Military Cross. Senatore Marconi, who is decorated with the Italian "Ordine Civile" of Savoy, has been nominated by the King of Italy to be a member of the Supreme Council of the same Order on the proposal of Signor Giolitti. In addition to being Chairman of the Board of Directors of the Marconi Company, Senatore Marconi is Chairman of the Banca Italiana Disconto and of the Lloyd Sabaudo Steamship Company.

Marriott, Robert Henry, Expert in Radiotelegraphy, U.S. Navy.—B. 1879. First experimented with wireless telegraphy in 1899, while student at the Ohio State University, U.S.A. Employed by the American Wireless Telephone and Telegraph Company, Philadelphia, 1901, for which company he erected stations at Breille, Galilee and Barnegat, N.J. Chief Engineer of the Pacific and Continental Wireless Telephone and Telegraph Company. Installed three stations in California, at Avalon, Santa Catalina Island, and San Pedro, 1902. Employed with the Carstarphen Electric Company at Denver, Colorado, 1903. Constructed stations for the American De Forest Wireless Telegraph Company, and its successor, the United Wireless Telegraph Company, in Colorado, Wyoming, and Texas, 1905. In charge of this Company's construction and maintenance, 1910. Entered Marconi Wireless Telegraph Company of America, 1911. Entered the U.S. Government service as Radio Inspector, 1912. Chairman, 1916, Seattle Section Institute of Radio Engineers. Member of the Committee on Standardisation. Fellow and Past-President The Wireless Institute, 1909-12.

Marvá, General J.—B. 1846. Practically the pioneer of Wireless Telegraphy in the Spanish Army. Founder of first Spanish Aerodrome at Cuatro Vientos. Author of many scientific works (*Mecánica aplicada a las construcciones*, *Tración en Vias ferreas*, etc.), Member, Royal Academy of Sciences, and International Association for experiments of materials.

McLachlan, Norman W., D.Sc. (Eng.), M.I.E.E.—Associate of the Heriot-Watt College and a D.Sc. (Engineering) of the University of London. Author of many papers on various subjects in the *Journal of the Institution of Electrical Engineers* and other scientific journals. Research Engineer in service of Marconi Company. B. Longtown, Cumberland, 1888. Educ. Carlisle Grammar School and the George Watson and the Heriot-Watt Colleges, Edinburgh. Served apprenticeship with Messrs. Bruce, Peebles and Co. In 1909 was appointed Lecturer in Engineering and Mathematics at Newcastle-on-Tyne. In 1913, Superintendent of a Technical Institute, and Supervisor of Classes in Engineering Subjects in the Liverpool Technical Institutes. During the war carried out much research work for Government in aeronautics and anti-submarine devices, organising a laboratory at Air Ministry for research on liquid and gaseous oxygen apparatus for aircraft use. After the Armistice engaged in magneto research at the National Physical Laboratory, Teddington. Address: Marconi Works, Chelmsford.

McMichael, H. Leslie, Honorary Secretary, Wireless Society of London.—B. Birkenhead, 1884. Educ. Ackworth and Technical College, Birmingham. Apprenticed to Messrs. Duckett and Brown, Electrical Engineers, Birmingham, afterwards taking control of one branch of the business. Among the first to hold a receiving and transmitting license in London, and had a highly efficient station in London prior to 1914. His work lay chiefly in the direction of sensitive

synthetic crystals, and with Mr. R. H. Klein he was responsible for the synthetic crystal "Radiocite." One of the moving spirits in the foundation of the Wireless Society of London, and has taken an important part in its management since its origin; first in the office of Vice-Chairman, and since 1919 as Honorary Secretary of the Society. During the war served in the Wireless Instructional Section of the R.A.F. Member of the Institute of Radio Engineers and a Director of some commercial concern. Address: 32, Quex Road, West Hampstead, N.W.6.

McPherson, Andrew, A.M.I.E.E., A.M.I.Mech E., M.I.Radio E. Head of the Wireless Shore Station Division of H.M. Signal School, Portsmouth.—B. 1880. Educ. at Allen Glen's School and the Royal Technical College, Glasgow. Engineering training with the Electric Construction Co., Ltd., of Wolverhampton. Was appointed Assistant Engineer to the Public Works Department of the Nigerian Government, Chief Engineer of the Nova Empreza Luz Electrica, Maceio, Brazil, and later Engineer and Manager of the Madiera Electric Lighting and Power (1909) Co., Ltd., Funchal, Maderia. Was for some time acting as special Brazilian correspondent to the "Electrical Review." Joined the G.P.O. in connection with the original scheme for the Imperial Wireless Chain, and in 1915 was transferred to the Admiralty in connection with Wireless Telegraphy Engineering. From 1915 to 1917 was engaged in inspecting and reporting on Wireless Telegraphy Stations abroad, visiting practically all Naval Overseas Wireless Telegraph Stations in every part of the world. Address: 22, Cousin's Grove, Southsea, Hants.

Meissner, Alexander.—B. Vienna (Austria) Studied at Technical High School and University, Vienna. Joined the Laboratory of the Telefunken Company, Berlin, 1907, and since that time has taken a very prominent part there in the development of the technique of wireless in Germany, having been responsible for the introduction of the Flat-coil, the most favourable diameter for high-frequency coils, musical quenched sparks, timed sparks, high-frequency machine, Telefunken compass, interference-reception with the detector, direct current cathode valve relay for Morse reception, etc. Invented the generation of oscillations with three electrode valves, 1913, as well as the triode, with back coupling for reception by beats. Has published a series of articles on his work in different periodicals.

Minohara, Dr. Eng., Lieut.-Com. (of Ordnance), Tsutomu.—Graduated from the Tokyo Imperial University, 1907. Entered Naval Arsenals of Maizuru and Kure and engaged in the manufacture of electrical equipment for radiotelegraphy. Member of the Wireless Research Laboratory in the Electrical Department of the Arsenal, 1912 Proceeded to France and Germany to study, 1914. Ordered home in consequence of the outbreak of the Great War, and resumed service at the wireless laboratory. Inspector of *post-bellum* condition of radiotelegraphy amongst the Allied Powers. Returned to Japan, 1918, and assumed service at the wireless laboratory again. Now engaged in the equipment of radiotelegraphy aboard war vessels and construction of high-power land stations at the electro-technical section in the Naval department; also employed in the improvement of continuous wave radio apparatus at the laboratory Appointed to serve in the Department of Communications, 1919, and juror of Patent Office, 1920.

Monckton, C. C. F.—B. Great Malvern, May 8th, 1867. Educ. at Uppingham and Malvern Colleges, and at the Central Technical College of the City Guilds. Employed by the Brush Electrical Engineering Company, from whom he passed to Messrs. Boustead Brothers, of Ceylon. Filled Government appointments in Jamaica and Trinidad. Superintendent of Telegraphs and Telephones to the Government of Fiji, 1911. Censor of telegrams during the war. Superintended the erection of the first Colonial Wireless Stations in the West Indies, 1904. Author "Radiotelegraphy" (1907). Acts in an advisory capacity to the High Commissioner for the Western Pacific with regard to all matters relating to wireless in the territories under that official's jurisdiction. Address: Suva, Fiji Islands.

Montefinale, Commander G. B., Italian Navy. —B. 1881. Educ. at Technical Colleges in Italy. Entered Naval Academy, Leghorn, 1899. Officer of the R.N., 1903. First appointment on H.I.M.S. "Andrea Doria," one of the first warships fitted with W/T. Assisted on board this vessel at important experiments in Adriatic and Ionian seas while Mr. Marconi and Marquis Solari experimented with new receiving devices at Ancona. W/T teacher at the R.N. Telegraphist School, 1908-10. Landed on Benadir coast, 1911, where he took part in erection of high-power Marconi station at Mogadiscio. During the Turkish-Italian war served in the Red Sea flotilla blockading Arabian coasts as W/T officer. Director of Radiotelegraphic service in the Italian Somaliland, 1912-14, visiting the whole region, taking part in all the most important occupations and establishing new wireless links in the boundary zone (Mahaddei-Uen, Iscia Baidoa, etc.). After a period of studies at Leghorn served in the Dreadnought squadron for a long period of the war. In December, 1916, while attached to the Inter-allied staff of Brindisi, sent to Red Sea as Director of Erytrea W/T service. Remained in the Marconi H.P. station of Massawa till the Armistice, co-operating with British authorities in Aden and Egypt to establish new links. Constructed a duplex station at Asmara for metropolitan W/T service. During the summer, 1918, gave a brilliant demonstration of long distance reception in Abyssinia. Chief of W/T Laboratory and Department of Spezia, June, 1919. Author of several papers on wireless telegraphy. Active correspondent of various periodicals and reviews. Member of the specialist body of the Italian Navy.

Moreno Quesada, D. Manuel, Lieut.-Com., Spanish Rayal Navy.—Sub-Director of the Compañia Nacional de Telegrafia sin Hilos, Madrid, where he carried out duties as Chief Engineer until 1st June of last year. Engaged in wireless work since the beginning of the application of this science in Spain. Besides the studies relating to his career at the Spanish Naval School, he has passed the courses of Electrical Engineering at the London Central Technical College. One of the most notable officers of the Spanish Navy, having distinguished himself in the North African campaign. Granted Cross of Maria Cristina. Representative of the Spanish Foreign Ministry in International Radiotelegraph Conference.

Moriceau, Gaston, Capitaine (of Colonial Artillery). Technical Adviser in Wireless Telegraphy (since February, 1921), French Colonial Office.—B. Doue-la-Fontaine (France), 15th September, 1879. Studied (1900-1902), Ecole Polytechnique of Paris. Sub-Lieutenant Colonial Artillery, 1902. Before the war served at

the Central Radiotelegraphic Military Establishment. During the war Chief of the Radio-telegraphic Service of French Indo-China (except from May, 1915 to May, 1916, when he served in Society Islands).

Mullard, S. R., M.B.E., A.M.I.E.E.—B. 1883. 1908, Assistant Works Manager to Société Anonyme des Usines Pintsch. 1910-15, Head of Research Laboratory Edison & Swan Electric Co., Ltd., during which period invented and developed Pointolite Tungsten Arc Lamp. 1916-18. Lieut. R.N.V.R. attd. R.N.A.S. 1918-19, Capt. R.A.F.; Head of Wireless Telegraphy Section at Air Ministry Laboratory, Imperial College of Science, S.W.7. 1919-20, Research in wireless valve development and construction; Contractor to Admiralty, War Office, Royal Air Force and Post Office, September, 1920. Managing Director, The Mullard Radio Valve Co. Club: R.A.F. Club. Address: Orient House, New Broad Street, E.C.2.

Nally, Edward Julian, President and Director Radio Corporation of America. Born in Philadelphia, April 11th, 1859, and educated in the Public Schools. Mr. Nally is a pioneer in different modes of communication in America, having had charge of the first Edison telephone in St. Louis, Missouri, before he had obtained his majority. He started his business career as a messenger boy for the Western Union Telegraph Company, in St. Louis, and worked his way up through various steps to the position of Vice-President and General Manager of the Postal Telegraph-Cable Company, which he resigned in 1913 to accept the office of Vice-President and General Manager of the Marconi Wireless Telegraph Company of America. Under his management the first commercial wireless circuit was opened to the public between the United States and Japan, in 1914. During the period of the war commercial wireless service by private companies was interrupted, but immediately upon the return of the stations by the United States Government on March 1st, 1920, Mr. Nally established the first direct commercial wireless circuit between the United States and Great Britain, which was soon followed by similar services to Norway, Germany, and France. Upon the formation of the Radio Corporation of America, in 1919, he was elected President and Director. He is also President and Director of the Pan-American Wireless Telegraph and Telephone Company and the Wireless Press, Inc. Married Lee Warren Redd, of Lexington, Kentucky, June 10th, 1897. Children, Marylee Nally Hahn and Edward Julian Nally, Jr. Clubs: Caxton, Brothers of the Book, Lawyers', Pennsylvania Society, American Irish Historical Society, Friendly Sons of St. Patrick. American Geographical Society, National Geographic Society, Ends of the Earth. Residence: The Trees, Ossining, N.Y. Business address: Woolworth Building, New York.

Navarro y Ortiz, D. Benito, Major, Spanish Royal Engineers.—Chief of the Wireless Service of the Army permanent land stations (1918). In 1913 took charge of the Spanish Army Station of Carabanchel EGC (Madrid), until 1918. Decorated by the Spanish Government with the White Military Cross (December, 1919) for his knowledge and merit in wireless matters. One of the most distinguished among the Spanish Royal Engineers in connection with Wireless Telegraphy. Has largely contributed to the wide development of this important scientific branch in Spain.

Nicholls, Lt.-Col. Hon. Frederic, J.P., F.R.C.L. (1911). President Marconi Wireless Telegraph Co. of Canada, Ltd.—B. England, November 23rd, 1856. Educ. Stuttgart, Germany. Went to Canada 1874. Founder of "Canadian Manufacturer," the then Official Organ and Spokesman of the manufacturing interest in Canada, of which he was editor and proprietor until 1893. Consul for Portugal. President Toronto Press Club, 1890. President Athenæum Club, 1893. Life Member Board of Trade. Hon. Member Canadian Press Association. Member Executive Committee, Canadian Manufacturers' Association. Gazetted Hon. Lieut.-Col., October 17th, 1914. Appointed to Senate January 20th, 1917. President and/or Director of many industrial and electrical concerns. Conservative; Anglican. Clubs: Bankers' Club of America, New York; York, Toronto; Albany; Engineer's; etc., etc. Address: 79, St. George Street, Toronto, Ontario, Canada.

Nicholson, Commander Richard Lindsay, D.S.O., late Royal Navy.—Born in London, 1882, educated privately; "Britannia." Entered Royal Navy 1898. Served as wireless officer on the staff of H.M.S. "Vernon," afterwards in the 2nd and 3rd Divisions of the Home Fleet, subsequently being transferred to the 2nd Division under Lord (then Sir John) Jellicoe. Subsequently qualified for the Naval War Staff, and served on the Admiralty Committee (1914) which revised the Naval wireless telegraph and signal books, etc. In July, 1914, was appointed wireless telegraph officer on Lord Jellicoe's staff, and in September of that year was appointed Fleet wireless telegraph officer of the Grand Fleet, vacating this appointment in February, 1917, on being appointed to the Admiralty. While Fleet wireless telegraph officer of the Grand Fleet Commander Nicholson served on the staff of Lord Jellicoe and then on that of Earl Beattie, and devised and introduced an improved form of wireless procedure for use in the Fleet, which was subsequently adopted throughout the Royal Navy and subsequently by the Allied Navies. Present at the battle of Jutland, promoted to Commander R.N., and appointed D.S.O., the wireless telegraph work of the Fleet being specially commended by Lord Jellicoe in his despatches. Appointed Director of Signal Division of the Naval Staff at the Admiralty in 1917, with the rank of Acting Captain, R.N., and retained this appointment until November, 1919. Retired from the R.N. July, 1920. January, 1921, appointed Director of Wireless Telegraphy under the Government, India. During service as Director of Signals at the Admiralty proposed and carried to fruition the formation of the "Wireless Board" and "Imperial Communications Committee." Has always evinced keen interest in Imperial Wireless Communications and constantly urged that an efficient organisation in this repect is an essential and pressing need of the Empire. Officer of the Legion of Honour, Commendatore of the Crown of Italy.

Noble, Sir William, Engineer-in-Chief to the British Post Office.—Commenced his career in Aberdeen Telegraph Office as a telegraphist. In 1893, Engineer for the north-east area of Scotland with headquarters at Aberdeen. In 1897 promoted to Headquarters, London, as First-class Engineer. Subsequently successively Technical Officer, Assistant Superintending Engineer, London, Staff Engineer at Headquarters, Superintending Engineer, London, and in 1912 Assistant Engineer-in-Chief, succeeding to the premier position in June, 1919. In 1919 the King of the Belgians created him a "Chevalier de l'Ordre de la Couronne" for "constant and generous help" during the war,

Knighted June, 1920. Address: General Post Office, London, E.C.

Norman, Major the Rt. Hon. Sir Henry, B.A., F.R.G.S., A.M.I.E.E., 1st Bt. cr. 1915, Kt. cr. 1906, M.P. (L) Blackburn since 1910. Chairman of Imperial Wireless Telegraphy Committee (reported May, 1920).—B. Leicester, September 19th, 1858. Educ. privately in France; Harvard University (B.A.); Leipzig University. Officer of Legion of Honour; Commander of Order of the Saviour; Officer of S.S. "Maurice" and "Lazare," and Crown of Belgium. Assistant Postmaster-General, 1910; Chairman War Office Committee on W/T (1912); Member of Committee on National Telegraphic Research and P.O. Telegraph Organisation Committee; Member of British Association Committee of Radiotelegraphic Investigation and of International Committee of Radiotelegraphic Research; Vice-President of Wireless Society of London; Fellow of Physical Society; Fellow of American Institute of Radio Engineers; Liason Officer with French Government for Military Inventions; Vice-Chairman Imperial Communications Committee, and Chairman of Wireless Sub-Committee. Address: The Corner House, Cowley Street, S.W.1.

Orme, Major Robert, B.A.—B. at Bray (Ireland), October 20th, 1865. Educ. in Irish schools and graduated B.A. at Trinity College, Dublin. Initiated career by taking up Electrical Engineering under Hugh E. Harrison at Hammond College, and then apprenticed to Anglo-American Brush Company. Since 1900 concentrated chiefly on wireless telegraphy and atmospheric electricity. Granted commission in R.F.C., January, 1915, organised and was given command of the Wireless School, Brooklands, November, 1915. Moved himself and his staff from Brooklands to Biggin Hill in September, 1916, where they were constituted first as the Wireless Testing Park and later as the Experimental Establishment, R.F.C. Address: Hollycroft, East End, Newbury, Berks.

Pannill, Charles Jackson.—B. Petersburg, Va., May 13th, 1879. Entered Navy 1898. Chief Telegraphist of United States Coast Signal Service. Entered service of Professor Reginald A. Fessenden, 1902. Conducted experiments in radio communication across Hampton Roads. Installed communication by radio between New York and Philadelphia, 1903. Installed first radio outfit on United States battleship. Conducted experiments between stations of General Electric Company at Lynn and Schenectady; also between Brant Rock, Mass., and Machrihanish Bay, Scotland. Holds commercial first-grade license No. 1. Entered service of United Wireless Telegraph Company as Division Superintendent, 1909. Erected shore radio stations on Great Lakes, later in charge of division south of New York. Entered service of Marconi Wireless Telegraph Company of America, 1912. Superintendent, Southern Division. Entered service of United States Government, 1914, as expert radio aid, Naval Radio Service. Promoted to Assistant to Director Naval Communications in charge of commercial radio service, 1917. Now General Manager, Independent Wireless Telegraph Company, New York. Fellow of the Institute of Radio Engineers. Member Washington Society of Engineers, Member of the Geographical Society.

Parker, J. N.—Representing Indian Post and Telegraph Department in England at the India Stores Depôt, Belvedere Road, London, S.E. Son of the late Major-General N. F. Parker, of the Bengal Army. B. July 6th, 1881, in Calcutta. Educ. Clifton College and the Royal Indian Engineering College, Coopers Hill. Passed out of the latter institution (1902) with diploma of Associate. Joined Indian Government Telegraph Department. Appointed to Electrical Engineer's Office, Calcutta, January, 1904. Accompanied Mr. M. G. Simpson, then Electrical Engineer-in-Chief, to Burma, February, 1904, to assist in preliminary wireless experiments. Continued his connection with the Electrical Engineer's Office and the technical side of telegraph work, which included the erection of several of the 30 kw. Marconi stations belonging to the Department. Superintendent Indian Wireless Telegraph Stations, 1914-19. Represented the Post and Telegraph Department at Poona in connection with the erection of the Imperial Chain Station, until work stopped early in 1915. Address: India Stores Depôt, Belvedere Road, Lambeth, S.E.1.

Pedersen, P. O., Professor in the Royal Technical College, Copenhagen. B. at Sig, near Varde, Jutland, June 19th, 1874. Entered Royal Technical College, Copenhagen (1892). Cand. Polytechnic (1897); Chief Engineer of Telegrafonen, Ltd. (Poulsen Patent), 1899-1902. Gold Medal Danish Society of Sciences (1907). Lecturer at the Royal Technical College, Copenhagen, and Professor from 1912. On board of Dansk Telegrafonfabrik (Danish Telegraphone Co., Ltd.), 1903-12, as well as on Elektroteknisk Forening (Electrotechnic Association) from 1910; Chairman from 1916. President Danish Institute of Civil Engineers, 1902. Director of Det Kontinentale Syndikat for Poulsen Radiotelegrafi (Continental Syndicate for Poulsen Radiotelegraphy) from 1911-19. Member of International Electrotechnical Commision. Fellow Inst. of Radio Engineers since 1915, Fellow Am. Inst. Electrical Engineers since 1920, and a Fellow Royal Danish Academy of Science since 1917. Member of the Telephone Commission (1917), of the Control Committee of licensed Telephone Companies, of the Commission on the training of radio operators, and of the Radio Commission of 1920. His contributions to electro-technical literature have been both important and numerous. Amongst those of recent appearance we may enumerate the following: "Om Poulsen-Buens Teori" (Copenhagen, 1917); "On the Theory of the Poulsen Arc" (*Proc.* Inst. Rad. Eng., New York), 1917 and 1919; "Poulsen-Buens Virkemaade," *Fysisk Tidskrift*, Vol. xvii (Copenhagen, 1918); "Den Elektriske Bues Elektronteori" (*Elektroteknikeren*, Copenhagen, 1917); "The Lichtenberg Figures" (Copenhagen, 1918); and "Townsend's Teori for Stoedionisation" (Copenhagen, 1918). Address: Amalievej 1, Copenhagen, V. Denmark.

Penido, Antonio Nogueira, Director-General of Brazilian Telegraphs (since 1918).—B. September 25th, 1864, at Juiz de Fóra, Minas Geraes. Civil Engineer of the "Escola Polytechnica" of Rio de Janeiro (diploma March, 1886). Was engaged in the construction of the Central Railway of Brazil; the Recife-Caruarú Railway, the Sorocabana Railway; port works of Rio de Janeiro and works at Saneamento of the town of Juiz de Fóra. Successively Engineer of Public Works of the State of São Paulo, Chief of Traffic of the Sorocabana Railway, Chief Engineer of the Itapura-Corumbá Railway, and Inspector-General of the Mogyana Railway.

Péri, T. M., Commandant of Colonial Infantry. Officer of the Legion of Honour. He inaugurated the wireless chain in Indo-China, which comprises fifteen transmitting and receiving and two

direction finding stations. During the war he superintended the construction of the high-power radio station at la Doua (Lyons), and on the 21st September, 1914, secured communication with Russia and later with America. Introduced the first C.W. apparatus for aircraft, employing vacuum tubes of his own invention. Co-inventor of the French valve (patented by Péri and Biguet, and subsequently acquired by the Marconi Company). Inventor in France of the resistance coupled amplifier (patent subsequently acquired by the Société Française Radioéléctrique), of the electrostatic condenser microphone and of apparatus for protecting radio receiving installations from disturbance by atmospherics. Address: Chef du Service, Radio télégraphique de l'Indo-chine, Hanoi, Tong-king.

Petavel, Sir Joseph Ernest, K.B.E., D.Sc., F.R.S., M.I.Mech.E., A.M.Inst.C.E., Director National Physical Laboratory, Teddington.—B. 1873. Educ. University College, London. Scientific Research at the Royal Institution and at the Davy Faraday Laboratory, 1896-98. John Harling Fellow, Owens College, Manchester, 1900-03. Scientific Manager, Low Temperature Exhibit of the British Royal Commission for the St. Louis Exhibition, 1904. Professor of Engineering and Director of the Whitworth Engineering Laboratories, University of Manchester, 1908-19. Publications: Papers in the Philosophical Transactions of the Royal Society, "The Philosophical Magazine," "Engineering," etc. Member of Aeronautical Research Committee and other Government Committees connected with Aviation. Member of Committee on Imperial Wireless Scheme Clubs: Athenæum; Royal Automobile, Primrose Club, London. Address: National Physical Laboratory, Teddington, Middlesex.

Petersen, Hermod.—Chief Engineer and Inspector of Wireless Telegraphy, Norwegian Government Telegraph Department. B. Christiania, 1875. Graduated as electrical engineer at Bergen Technical College, afterwards attending the Polytechnic University at Karlsruhe, Baden. Chief of the Telegraph Schools, 1900-13. One of the pioneers of wireless telegraphic expansion in Norway. Superintended the first radio experiments, 1901. Later on formulated schemes for all wireless land stations along Norwegian coast. Member of the first International Conference on Wireless Telegraphy, Berlin, 1906. Engineer-in-Charge during the erection of a wireless station at Spitzbergen (1911), which communicates with a similar station in the North of Norway. Remained in charge during its first winter. Chief of the Norwegian Wireless Department, 1913. Superintends the land stations. Also Government Wireless Inspector, controlling all the ship stations of Norway. Published a number of technical books for instructional purposes, principally on the subject of telephony and telegraphy, both wired and wireless.

Petit, Gaston Emile.—Electrical Engineer in the French Postes et Télégraphes; Technical Director of the Compagnie Générale de Radiotélégraphie. B. Paris, 1877. Chief of the Service of Wireless Telegraphy at the French Postes et Télégraphes, 1905-11. Member of the International Conference on Wireless Telegraphy, Berlin, 1906.

Pickard, Greenleaf Whittier, A.A.A.S.—Electrical Engineer. B. Portland, Me., February 14th, 1877. Educ. Westbrook Seminary, Lawrence Scientific School, Harvard, and Mass. Institute of Technology. Has made a special study of wireless telegraphy and telephony, and has taken out many United States and foreign patents for wireless inventions, among which are the crystal detector and radio compass. Executed good pioneer work in radiotelephony, and still actively engaged in this branch of the science. Began radio work, 1899, at Blue Hill Observatory, Milton, Mass., under a grant from the Smithsonian Institution. Became associated with Harry Shoemaker, 1901. On the engineering staff of the American Telephone and Telegraph Company, 1902-06. Developed a practical system of radiotelephony, obtaining successful speech transmission without wires, 1902. From 1906 until the present date has been connected with the Wireless Specialty Apparatus Company as consulting engineer. Inventor of a novel method of reducing static interference, which was extensively used by the U.S. Navy for transatlantic reception during the war. Practices extensively as patent expert in wireless patent litigation, and is the author of many papers on radio communication. Fellow of the American Institute of Electrical Engineers. Member of the American Chemical Society. Member of the American Electrochemical Society. Member of the Society of Mechanical Engineers. Member of the American Institute of Mining and Metallurgical Engineers. Member of the American Meteorological Society. Member of the Society of Chemical Industry. Past President and Fellow of the Institute of Radio Engineers. Club: Engineers'. Private address: Newton Centre, Mass. Office address: C and Fargo Streets, Boston, Mass.

Pletts, John St. Vincent.—B. Ryde, I. of W., 1880. Educ. locally and at Central Technical College. Joined Marconi's Wireless Telegraph Company, Ltd., 1899. Constructed wireless stations in Hawaii, Labrador, the Congo, Russia, and the Far East. Deputy Chief of Staff, 1906. Head of that Company's newly formed Patent Department, 1910. Expert in Cryptography at the War Office, 1914. Consulting Engineer, 1919. Member of various scientific societies, and author of a number of technical articles. Address: Marconi House, W.C.2, and Shalston House, Ewell Road, Surbiton.

Poulsen, Valdemar, Eng. D.Sc., D.Ph. (h.c.) Leipzig (1909).—B. Copenhagen, November 23rd, 1869. Studied at University of Copenhagen, 1889-93. Entered technical department Copenhagen Telephone Company, 1893, and for a number of years superintended electrical testing operations. Holds Medal for Merit in gold with crown. Collaborated with Prof. P. O. Pedersen for many years. Member of the board of the Telegrafonen, Ltd. (Poulsen Patent), 1902-16. Joined board of Dansk Telegrafonfabrik, Ltd., 1909, and that of Poulsen Wireless Telephone and Telegraph Company, U.S.A. (1909-11). Fellow of Danish Society of Sciences (1914). Grand Prix at Paris in 1900 for telephone work. Invented in 1903 the arc method of generating continuous electrical waves of wireless frequencies. Danish Society of Sciences' Gold Medal (1907). Publications: "Une Méthode pour Produire des Oscillations non Amortiés et leur Emploi dans la Télégraphie sans Fil": and "La Téléphonie sans Fil: Rapport Officiel au Congrès International des Applications Electriques," Turin, September, 1911 (Copenhagen, 1912). Address: Gentofte Maltegaardsvej 6, Copenhagen.

Prince, Major Charles Edmond, O.B.E. Technical Manager of the Aircraft Department, Marconi's Wireless Telegraph Company, Ltd.—B. Capetown, 1874, son of Rev. E. B. Prince, sometime Vicar of Tor Mohun, Torquay. Educ.

Clifton College (Science Exhibitioner) and Faraday House. Married in 1908 Amelia Ella Verner. Published 1905 "Ode on Poetry and other Poems" (Harrison, Pall Mall). etc. Joined Marconi's Wireless Telegraph Company, Ltd., 1907, specialised in Research Work and particularly in Wireless Telephony. Demonstrated first Marconi Field Station in Italy and Switzerland, 1909. Instituted important improvements in Bellini-Tosi Direction Finding System. Granted commission in Westmorland and Cumberland Yeomanry, 1911. Attached R.F.C., April, 1915. Developed at Brooklands in same year first aircraft wireless telephone. Gazetted experimental officer (First Class), December, 1915. Mentioned in despatches 1918, and in the same year appointed Major. Granted M.B.E. 1918, O.B.E. (Military Division), 1919. Addresses: Stubbings Manor, Burchetts Green, Berks.; 63, Drayton Gardens, London, S.W.

Pupin, Dr. Michael I., Director of Research Laboratory, Columbia University, New York, ex-President, Institute of Radio Engineers.—B. Hungary, October 4th, 1858. Went to the United States 1874. Studied at Colombia University. Graduated 1883. Study continued at Cambridge, England, and Berlin. Returned to the United States. Professor of Mathematical Physics at the Columbia University, 1891. Among his first original work may be mentioned the development of electrical resonance, before the introduction of wireless telegraphy. Patents issued to him on electrical selectivity were licensed to Marconi's Wireless Telegraph Company, 1903. Has worked extensively in the development of his inventions in connection with telephones and telegraphs, and many of his improvements are known by his name throughout the world. Has recently been engaged in the development of a new method of electrical selectivity to be used in connection with wireless telegraphy. Has also been engaged in research work in wireless telephony.

Rego, Capt. T. R. Moraes, Chief of the Radiotelegraphic Service, Brazilian Navy.—B. Rio de Janeiro, March 8th, 1882. Completed training at Naval Academy, 1900. Served for a few years on ships, studying electricity and torpedoes. Torpedo Lieutenant in the Professional Torpedo School. Began studying radiotelegraphy when first wireless stations were installed in Brazilian Navy, 1904. Perfected his knowledge of the subject on special trips to Europe and America. Assistant in the Radio Department of the Navy on various occasions. Appointed (1914) Chief of the Radio Service, a post which he still holds. Address: 22, Ipanema Copacabana, Rio de Janeiro.

Rendahl, R. H.—B. 1878. Electrical engineer in the Royal Swedish Navy Department, 1909; attached to the Swedish Board of Admiralty, 1912; wireless expert attached to the Swedish Navy. Knight of the "Nordstjaerna" Order, and holder of several foreign orders. Address: Djursholms, Ösby, Sweden.

Reoch, Alexander, Wireless engineer, American Marconi Company.—B. Sheffield, England, 1884. Educ. Sheffield Science School and Sheffield University College. Graduated in electrical engineering, 1902, winning the Mappin Medal and Prize in that year. Entered the service of the English Marconi Company in June, 1902, and undertook construction and operating work for that company in England, Holland, Germany, and Egypt. Appointed engineer with the Canadian Marconi Company, 1905. From 1909 to 1911 temporarily in complete charge of the business of the Canadian Marconi Company, during which time the company's contract with the Canadian Government for the operation of the Great Lakes stations was negotiated, as well as the contract between the Canadian Company and the Newfoundland Government. Chief Engineer of the Canadian Marconi Company, 1917, and at the beginning of 1918 he relinquished this position to take an appointment on the engineering staff of the American Marconi Company. Appointed, 1920, Plant Engineer, Radio Corporation of America. Appointed January 1st, 1921, Assistant Chief Engineer Radio Corporation of America. Address: 233, Broadway, New York.

Ribeiro, Alvaro Nunes, Commander and Director, Radiotelegraphic Station of Monsanto.—B. Lisbon, 1879. Educ. National Lyceum and the Lisbon Polytechnic School. Cadet in the Naval School, 1898. Completing his training there, was commissioned to join an expeditionary force to the Zambesi. On his return to Portugal he was appointed naval instructor at the Torpedo and Electrical School, where he devoted himself to the study of wireless. Leading member of the Naval Commission on Organisation, 1910, where he strongly advocated the establishment of a naval staff for war purposes. Member of Parliament. Member of the Commission on Posts and Telegraphs. Secretary to the Naval Commission. As a member of the Posts and Telegraphs Commission he fathered a Bill for the organisation of Portuguese Colonial Wireless, and as soon as the Act had been passed by Parliament a contract to carry out its provisions was concluded with the Marconi Company. Commanded the vessels "Berrio" and "Patrao Lopez" engaged in rescue work, when he met with a serious accident trying to save a cruiser. As a consequence returned to shore service, where he organised the Portuguese Coast Service, and formulated a code of regulations. Address: R. Vieira da Silva 64, Lisbon.

Rinde, K. Werner J., Junr.—B. Falun, 1882. Educ. Falun and Goteborg University. Telegraph clerk, controller, etc. Studied W/T and telephony systems and traffic, during voyages to Holland, Great Britain, Germany, Austria, Italy, and U.S.A. 1912-13 (autumn 1912 for some months with the Marconi Companies in Rotterdam and at sea). Teacher at W/T school of Royal Swedish Telegraph Board from 1914. Supt. of the W/T station at Vaxholm, Sweden, 1914-16, of Karlsborg Radio since beginning of 1917. Address: Karlsborg, Sweden.

Rivers-Moore, H.R., B.Sc., A.C.G.I., A.M.I.C.E., A.M.I.E.E.—Educated at Wellington College and London University. Three years apprenticeship George Clark Ltd., Engineers, Sunderland. Post Office Engineer-in-Chief's Dept. 1907. Delegate to 2nd International Telegraph Conference at Paris 1910. Appointed to Wireless Section of the Post Office December, 1910. In 1913 purchased and carried on the business of the Wilson Apparatus Co., manufacturing transformers, Wilson coils, and other Wireless apparatus. In 1916 this business was taken over by the Indo-European Telegraph Co., Ltd., and associated successively with Messrs. Creed & Co. Ltd., Croydon, and Automatic Telephone Co. Ltd., Liverpool. Appointed in 1918 Asst. Physicist at Admiralty Anti-Submarine Dept., Parkstone Quay, and subsequently given the rank of Hon. Capt. Marines. In 1920 organised the firm of "R. M. Radio Ltd.," undertaking the supply and maintenance of Wireless Equipments of all kinds and is Chairman of this Company.

Robinson, James, M.Sc. (Dunelm), Ph.D. (Göttingen).—B. September 9th, 1884. Studied Mathematics and Physics at Armstrong College, University of Durham and at the University of Göttingen. Pemberton Fellow of Armstrong College, University of Durham, 1906-09. Publications (Physics): Dust Figures in Kundt's Tube (papers in "Physikalische Zeitschrift," Philosophical Magazine, Proceedings of the Physical Sociey of London, between the years 1908 and 1913). Absorption of Cathode Rays in Gases (papers in "Annalen der Physik," "Proceedings" of the Philosophical Society of the University of Durham, in 1910). Photoelectric effect (papers in the "Philosophical Magazine," 1910-15). Papers on Directional Wireless and Reception on Aircraft (in "Radio Review"). Appointments: Armstrong College, Demonstrator in Physics, 1906-07; Lecturer in Mathematics, 1909-10. University of Sheffield, Lecturer and Demonstrator in Physics, 1910-12. East London College, University of London, Lecturer in Physics, 1912-15. Examiner in Physics, University of London, 1912-15. Wireless experience: Commenced in 1915 in the R.N.V.R. as Lieut., R.N.V.R. In 1917 attached R.N.A.S. for experimental W/T work. Various patents. Address: Chief Experimental Officer at the Instrument Design Establishment, Biggin Hill, Kent.

Robison, Samuel S., Rear-Admiral U.S. Navy. Member of the Institute of Radio Engineers.—B. May 10th, 1867. Graduated from the U.S. Naval Academy, 1888. In personal charge of the Division of Radiotelegraphy in the Bureau of Equipment, Navy Department, 1904-06, and in general charge from 1909-11. Author of the "Manual of Wireless Telegraphy for Naval Electricians," first issued in 1906, and revised for several subsequent editions. Address: Boston Navy Yard, Boston, U.S.A.

Rodrigues, Apolinio Gomes da Silva, Flag Captain in the Portuguese Navy.—B. May 31st, 1866. Finished education and entered Portuguese Navy in 1886. Became Professor of Electricity and Torpedoes at the Naval College in 1902, and Professor of Electricity of Naval Auxiliary College, 1903. Received his present rank of Flag Captain in 1907. Entrusted with embodiment of Naval Regulations concerning wireless in 1909. Elected Member of Advisory Committee on wireless in the Portuguese Navy in 1910. Address: Portuguese Admiralty, Lisbon.

Rutherford, Sir Ernest, Kt., F.R.S.—B. New Zealand, 1871. Educ., Nelson College, Canterbury College, Christ Church, New Zealand University, Cambridge University, Langworthy Professor and Director of Physical Laboratories, Manchester University since 1907. Has published many works dealing with the conduction of electricity through gases and radio activity. Address: Manchester University.

Rydin, Sven Ludvig Herman.—Since 1905 Director of Telegraphs in Sweden.—B. Upsala, October 2nd, 1861. Graduated in Law, Upsala, 1885, solicitor's clerk 1887, Registrar in the Lower House 1888-90, Registrar in the Upper House 1890-97. Auditor attached to the Swedish State Railways 1890-97, Registrar attached to the Board of the State Railways 1895-96, assistant to the Director of the State Railways 1896-97, Member of the Board of Telegraphs 1897-1902, Under-Secretary of State for Home Affairs 1902, Grand Commander of the "Nordstjaerna" Order and holder of several foreign decorations. Address: Kungl. Telegrafstyrelsen, Stockholm.

Salmond, Captain J. S. C., R.N.—B. 1881. Entered "Britannia," 1897, left 1898. Served in China in "Barfleur," landed in the Boxer operations, 1900. Mentioned in despatches. Served in Pacific in "Grafton" and "Flora." Qualified as torpedo lieutenant, 1905. Served in Atlantic in "Antrim" as lieutenant (T.). Served in Wireless Telegraphy Experimental Department, "Vernon," 1908-11. Squadron Wireless Telegraphy Officer, 2nd Battle Squadron in "Hercules," 1911. Fleet Wireless Telegraphy Officer, Home Fleet (later Grand Fleet). in "Neptune" and "Iron Duke," 1912-15. Wireless Telegraphy Assistant to D.N.O. Admiralty, 1915-17. In command of "Odin," in Red Sea, 1917-19, mentioned in despatches for operations against Turkish forces in the Asir and Yemen. Serving in Signal Division, Admiralty, on Wireless Telegraphy duties. Member of Radio Research Board. Address: Admiralty, London, S.W.1.

Saltzman, Charles McKinley, Brigadier-General, Executive Officer in the Chief Signalling Office. —B. 1871, State of Iowa. Started business as railway telegraphist and graduated at West Point, 1896. As cavalry officer took part in the Spanish-American War, 1898. Signal officer during the Insurrection in the Philippine Islands. Transferred to the Signal Corps of the U.S. Army, 1901. Since identified with the electrical, cable and radio work, U.S. Army. For a number of years in charge of the Electrical Laboratory of the Signal Corps in Washington, where radio equipment of the U.S. Army is designed and tested. In charge of the radio work of the U.S. Army on the Panama Canal. Represented the United States at the International Radiotelegraphic Conference of London, 1912. Member of the Inter-Departmental Board which prepared regulations for the control of radiotelegraphy in the U.S.A. Address: Office of the Chief Signal Officer, Signal Corps, U.S.A., Washington, D.C.

Sankey, Captain M. P. H. Riall, C.B., C.B.E. R.E. (Ret.).—B. Nenagh, Ireland, 1853. Educ. Switzerland, Royal Military Academy, Woolwich, School of Military Engineering, Chatham. Served in England, at Gibraltar, and as Instructor in Fortification at the Royal Military College, Kingston, Canada. Posted to the British Ordnance Survey, and had charge of the Trigonometrical Division, the Electrotyping Department and the Workshops. Retired from the service (1889) to join the Board of Messrs. Willans and Robinson, Ltd., and (1904) took up consulting work. Shortly afterwards joined the Boards of the Marconi's Wireless Telegraph Company, Limited, and of the Marconi International Marine Communication Company, Limited. Also a Director of several other companies. An accepted authority on thermodynamic problems. Member of the following institutions: Civil Engineers, Mechanical Engineers (President 1920 and 1921), American Mechanical Engineers, Electrical Engineers, Iron and Steel, Naval Architects Junior Engineers, and Gas Engineers. Member of the Governing Board of the National Physical Laboratory and of the Wireless Telegraphy and Gaseous Explosives Committees of the British Association. Served during war as Hon. Engineering Advisor to the Director of Fortifications and Works. Served on the Hon. Valuation Advisory Committee of Experts, dealing with the plant and buildings installed by manufacturing firms for munition purposes. Address: 57, Castle Bar Road, Ealing, W.5.

Sarnoff, David.—B. in Russia, February, 1891. Entered the United States July, 1900. Started

business 1906, and in 1907 received an appointment as Wireless Operator at the Marconi Station located at Siasconset, Nantucket Island, Mass. Served at various ship and shore stations, and eventually became Manager at the Marconi Station at Sea Gate. Has held a number of responsible positions in the service of the Marconi Wireless Telegraph Company of America, being now Commercial Manager of the Radio Corporation of America. Vice-President and Director of the Pan-American Wireless Telegraph and Telephone Company. Secretary of the Institute of Radio Engineers for 1915-1916-1917. Author of a paper on Radio Traffic read before the Institute of Radio Engineers, and a number of other papers on wireless telegraphy. Addresses: 90, Pinehurst Avenue, and 233, Broadway, New York.

Sayeki, Mitsuru, Chief Radio Engineer Installation and Inspection Section of the Direction General of Japanese Posts and Telegraphs since 1908. B. Japan, 1871. Entered Naval College, 1889. Entered the Electric Technical Laboratory in the Ministry of Communications 1895, and has been engaged in the investigation of radiotelegraphy since 1899. He was connected with the "Teishinsho" Radio System, Government and private commercial coast stations and commercial ship stations in Japan. Received prizes and medals for his investigations in radiotelegraphy. Address: 23, Kasumicho, Azabu, Tokyo.

Schledermann, Helmuth Joh. Christian, Electrical Engineer-in-Chief to the Royal Danish Navy. Knight Dannebrog, Knight Norwegian St, Olav.—B. Copenhagen, September 24th, 1876. Educ. Royal Naval Engineering College; Polytechnic Academy of Copenhagen. Further training with electrical firms in foreign countries. Controls the Electrical and Wireless services of the Danish Navy, also Inspector of Danish W/T stations and Electrical and W/T adviser to the Danish Lighthouse Department. Member of the Danish Engineers' Assn., the International Electro-technical Commission and a Commission dealing with erection of a high-power wireless station in Denmark. Publication: A manual on W/T for the Danish Royal Navy. Address: Taffelbays Alle 11, Hellerup, Denmark.

Schwill, Fr., Sub-Director of the International Bureau of the Telegraphic Union at Berne. —B. Strasburg (in Alsace), April 21st, 1875. Started career as Member of the German Post and Telegraph Service. Took part in the International Radiotelegraphic Conference at Berlin in 1906, at the close of which he was appointed by the Swiss Federal Government to the International Bureau of the Telegraphic Union to organise and supervise the new Radiotelegraphic Section established by the Berlin Conference. Address: Bureau International de L'Union Télégraphique, Berne.

Scott-Taggart, John, Educ. Technical establishments and King's College, London. Two years departmental Manager and Research Engineer, Radio Communication Co., Ltd. Acts as patent adviser to C. F. Elwell, Ltd., and Mullard Radio Valve Co., Ltd., and in a technical advisory capacity to other concerns. Some time in charge of valve design and construction at Ediswan Lamp Works. Served 1914-1919; some time Instructor of Wireless to 1st Army, but chiefly Wireless Officer to various units. Mentioned in Despatches and later awarded Military Cross. Author of various papers before British Association and other Societies, and of over fifty articles; also the volume "Thermionic Tubes in Radiotelegraphy and Telephony." He is a Fellow of the Institute of Physics and holds membership in the Physical Society and the British, American, and French Institutions of Electrical Engineers; also President of two wireless societies and committee member of Wireless Society of London. Has produced several inventions of commercial importance, particularly in connection with Thermionic Valves. Address: 6, Beattyville Gardens, Ilford.

Shaughnessy, Edward H., O.B.E., M.I.E.E. M.I.RadioE.—B. 1871. Engineer in charge wireless section, Engineering Department, British Post Office. Entered Post Office Engineering Department, 1896, served in experimental, testing, telegraph, and cable sections, specialising on underground and submarine cables. Served as a cable engineer (1895) on s.s. "Faraday," during the laying of a sub marine cable in Gulf of Mexico, and the repair of other cables. After five years in the provinces on construction and maintenance work returned to London (1913) to take up present position. For many years lectured on telegraphy, telephony, etc., at various London Technical Institutes. Member of the Radio Research Board. Post Office representative on Committee of Wireless Section, Institution of Electrical Engineers. Vice-President, Wireless Society of London. Examiner in Telegraphy for the City and Guilds of London Institute. Member of some committees and panels of the British Engineering, Standards Association. Address: Engineering Department, General Post Office, London.

Shoenberg, I.—B. 1880. Graduated at the Polytechnical Institute of Kieff. In 1905 joined the Russian Marconi Company on the day of its inauguration, being appointed Chief Engineer. Held this post until 1914, when he left Russia for England, joining Marconi's Wireless Telegraph Company in the capacity of Consulting Engineer. Since 1919 engaged as Chief of Patent Department. Address: Marconi House, Strand, W.C.2.

Simpson, Lt.-Col. Adrian F.R.S., C.M.G., A.M.I.E.E. (late) R.E.—B. Edinburgh, 1880. Educ. in his native city, and at Clifton and the Royal Military College, Sandhurst. Commissioned in His Majesty's Forces, 1900. Served in India, being transferred to the Regular Indian Army. Visited Russia 1903-5 for linguistic study. Becoming interested in wireless telegraphy, left the Army and started work with the English De Forest Wireless Telegraph Syndicate. His connection with Marconi's Wireless Telegraph Company commenced with his joining the Field Station Department. On the formation of the Russian Company of Wireless Telegraphs and Telephones, 1908, appointed managing director of that company. During the war served in Russia and at the War Office. Late Director of Wireless Telegraphy under the Government of India. Director and Joint General Manager Marconi Wireless and International Companies. Chevalier of Order of St. Anne, 3rd Degree, and of Order of S. Stanislas, 2nd Degree, with Crossed Swords.

Sins, Ernest.—B. 1859, Besançon, where he received his early education. Joined the Ecole Polytechnique, and began his career by enrolling in the Corps of Telegraph Engineers. Participated in the organisation of the telegraphic and telephonic systems in Tunisia. Received an appointment in the Central Office of Posts and Telegraphs, Paris, 1892, where he ultimately rose to the position of Telegraph Engineer-in-Chief. Chief of the

Correspondence Department of International Telegraphy, 1899, and took special interest in wireless telegraphy. Repesented his country at the International Conferences on Radiotelegraphy held at Berlin, 1903, and acted as Secretary to the Commission appointed by the latter Conference for drawing up regulations. Sub-Director of the French Telegraphic Department, 1911, but resigned from the public service in the same year in order to be at liberty to take part in the development of wireless industry. One of the founders and directors of the Compagnie Générale Radiotélégraphique, and was afterwards managing director to the Compagnie Universelle de Télégraphie et de Téléphonie sans Fil. Since the beginning of 1918, general manager of the Compagnie Générale de Télégraphie sans Fil.

Slee, Commander J. A., C.B.E., R.N. (Ret.)—B. May, 1878, Wimbledon. Educ. on training ship "Britannia." First appointment as midshipman was to H.M.S. "Centurion," on which vessel he sailed for China, 1894, being transferred, three years later, to the brig "Nautilus" for sailing experience. Passed for his lieutenant's commission, obtaining four firsts out of a possible five. After service on the "Decoy," "Ernest," "Anson," and "Severn," qualified as Torpedo Lieutenant, and spent a year on the staff of the "Defiance" at Devonport, where he gained his first wireless experience, 1901. Whilst attached to H.M.S. "Queen," 1906, eyesight trouble developed and he was obliged to transfer to shore service. For two years after quitting the sea he served as one of the Wireless Telegraph Experimental Officers on the "Vernon" at Portsmouth, and from 1908 until 1919 was in charge of all shore wireless and war signal stations in Great Britain. Promoted Acting Commander, 1913 Acting Captain, 1918. On the formation of the Wireless Board, Captain Slee was appointed its chief. Awarded an O.B.E., January, 1919, C.B.E., April, 1919. Retired from the Navy due to the eyesight trouble mentioned above, December 1st, 1919, with the rank of Commander. Joined the Marconi International Marine Communication Co. as Technical Superintendent and Adviser, January, 1st, 1920. Appointed Technical Manager, M.I.M.C. Co., Ltd., June, 1921. Address: 7, Elvaston Place, London.

Smith-Rose, Reginald Leslie, B.Sc., D.I.C., A.R.C.S., A.M.I.E.E.—Educ. Imperial College of Science and Technology: (*a*) Royal College of Science, 1912-14; (*b*) City and Guilds (Engineering) College, 1914-15. Diplomas: Bachelor of Science, London, First-class Honours; Royal Scholar, Physics, First Place: Associate of Royal College of Science (A.R.C.S.), Class 1, Physics Prizeman. Diplomée of the Imperial College (D.I.C.) for Research Work in Wireless Telegraphy at the City and Guilds (Engineering) College. Practical experience with Messrs. Siemens Bros., Woolwich, from 1915-19; engaged on experimental work in connection with Military, Manual and Automatic Telephones; and latterly with Thermionic Valve Amplifiers for Telephone Lines and Wireless Receiving sets. Now an Assistant at the National Physical Laboratory, engaged on research on Thermionic Vacuum Tubes and general wireless work. Member of Sub-Committee "D" on Thermionic Valves, of the Radio Research Board of the Department of Scientific and Industrial Research. Physicist-in-Charge of Directional Wireless Research under Sub-Committee "C" of the Radio Research Board. Senior Lecturer in Wireless Telegraphy and Telephony at the Polytechnic, Regent Street, W. Past Chairman and Hon. Secretary of the Students' Section of the Institution of Electrical Engineers. Author of various scientific papers. Address: National Physical Laboratory, Teddington.

Smith, Tom Vincent, Major, M.C., M.I.E.E.—B. 1872 in West Dulwich, London. Joined the Amalgamated Radio Telegraph Company in 1906 Director of the British Radio Telegraph Company. Consulting engineer until outbreak of War. Served on the Civil Aerial Transport Committee, and the Wireless Committee of the Institution of Electrical Engineers. President of the National Association of Supervising Electricians. Papers before the Royal Artillery Institution at Woolwich on "The Co-operation of Aeroplanes with Artillery," and before the British Association on "Aircraft Wireless during War." War Services: Joined No. 1 Reserve Air Squadron at Farnborough, January, 1915. No. 7 Squadron in France, February, 1915. Wireless Officer to No. 3 Squadron in March, and to the 1st Wing in May, 1915. R.F.C. General Headquarters in March, 1916, in charge of R.F.C. Wireless on the Western Front. 1917, Officer-in-Charge of Wireless at the Air Ministry for all theatres of War. 1918, Wireless Officer to the Independent Air Force until end of War. Decorations: Military Cross, Knight of the Military Order of Savoy, 1914-15 Star, General Service Medal, Victory Medal with oak leaves, King Edward's Coronation Medal, twice mentioned in despatches. Address: Royal Thames Yacht Club 80, Piccadilly, W.1.

Snell, Sir John Francis Cleverton, Kt. (Cr. 1914), M.Inst.C.E.—Chairman, Water-Power Resources Committee of the Board of Trade, and was a member of the Imperial Wireless Telegraphy Committee. Past President of the Institution of Electrical Engineers, Fellow of the American Institute of Electrical Engineers. Member of the Advisory Council for Scientific and Industrial Research and a member of many other scientific societies. Formerly partner of Preece, Cardew, Snell and Rider, Consulting Engineers. Now Chief Electricity Commissioner under the "Electricity (Supply) Act, 1919." B. at Saltash, Cornwall, December 15th, 1869. Educ. Plymouth Grammar School and King's College, London. After service (1883) with Woodhouse and Rawson, and (1889) with Crompton & Co., appointed resident Engineer for the late General Webber, C.B., R.E., at South Kensington, and subsequently became the General's Chief Assistant. Appointed Borough Electrical and Tramways Engineer, Sunderland, August, 1896. In 1906 started practice as Consulting Engineer, Westminster, first with Mr. S. S. Moore Ede and afterwards amalgamating with Preece, Cardew, Snell and Rider in 1910. Acted as principal technical witness for the Crown in the arbitration proceedings of the National Telephone Company, 1912. In 1917 appointed Member of the Electric Power Supply Committee of the Board of Trade, and in 1919 Chief Electricity Commissioner (Designate), in which capacity he undertook the piloting of the "Electricity (Supply) Bill" through both Houses of Parliament. To fill this capacity he resigned his consulting practice and position in his late firm. Address: Wey Barton, Byfleet, Surrey.

Solari, Marquis Luigi.—Cavaliere Ufficiale della Corona d'Italia, Cavaliere dei SS. Maurizio e Lazzaro, Commendatore of Danilo, and Cavaliere of St Anna. Received decorations of bronze medals for the campaigns of China and Africa. —B. in Turin. Was appointed officer of the

Italian Royal Navy in 1890. Obtained the diploma of Electrical Engineer at the University of Turin in 1898. In 1900 placed in charge of the Laboratory of Wireless Telegraphy at the Royal Dockyard of Spezia. In 1902 took charge of the wireless telegraph station on the Italian warship "Carlo Alberto" during the historic experiments on that vessel conducted by Senatore Marconi. In 1903 delegate of the Italian Government to the Berlin Wireless Conference. In 1904-05 supervised the Wireless Telegraph Department of the Italian Ministry of Posts and Telegraphs. Official delegate of the Italian Government at the International Congress of Electricity held at St. Louis, U.S.A., in 1904. Joint inventor with Professor Lori, of the Padua University, of a magnetic relay. Has published several papers on wireless telegraphy in various periodicals and reviews. Since 1906 has devoted himself to the development of the Marconi system in Italy. Address: Via Maria Adelaide, 8, Rome (Italy).

Squier, Major-General Sir George Owen, K.C.M.G., Ph.D.—Chief Signal Officer U.S. Army. Formerly millitary attaché to the American Embassy in London. Educ. Johns Hopkins University, Baltimore. Grad. Doctor of Physics 1893. Research student under the late Professor Rowland and in the laboratory of the late Sir William Preece at the British General Post Office. Discovered the use of living trees as a means of receiving wireless messages 1904, and published a paper entitled "The Absorption of Electro-Magnetic Waves by Living Vegetable Organisms." On June 28th, 1911, an important treatise by him, dealing with multiplex telephony and telegraphy by means of waves guided by wires, was read before the American Institute of Electrical Engineers. Author of numerous papers on the subject of wireless telegraphy and has devoted special attention to the use of wireless telegraphy in military operations. Awarded the Elliott Cresson Gold Medal for his researches in multiplex telephony, 1912. Presented a paper on "Cable Telegraphy" to the Physical Society of London, June, 1915, advocating the adaptation of Wireless Engineering methods to ocean cables. Author of "Tree Telephony and Telegraphy," "Multiplex Telephony and Telegraphy over Open-circuit Bare Wires Laid in the Earth or Sea," etc. Member of National Academy of Sciences, 1919. Awarded the Franklin Medal, by the Franklin Institute of Philadelphia, Pa., 1919. Awarded the Distinguished Service Medal, United States Army, 1919. Representative of War and State Departments, at the Conference of Interallied Radio Technical Committee, at Paris, France, June-September, 1921. Address: War Department, Washington, D.C., U.S.A.

Stanley, Rupert, Principal Municipal College of Technology, Belfast. Chevalier of the Legion of Honour.—B. in Ireland, 1876. Educ. Irish schools and universities. Joined technical staff of the Isle of Thanet Electrical Light and Power Company in 1899, and two years later appointed Lecturer in Physics and Electrical Engineering at the Brighton School of Science and Technology. Returned to Belfast in 1903 as Professor of Physics and Electricity at Belfast Municipal Institute. Member of the Institution of Electrical Engineers. In 1914 undertook the preparation of a "Text-book of Wireless Telegraphy," which has become a standard text book on the subject, both at home and in America, and is now published in two volumes, of which the second deals exclusively with valves and valve apparatus. Started war service as second in command of a Field Company in the Ulster Division, but was soon transferred to radio-telegraph work, and served in France from October, 1915, to April, 1918, where he became Chief Wireless Instructor to the B.E.F. Address: Municipal College of Technology, Belfast.

Stone Stone, John.—Studied electricity, chemistry, physics and mathematics at Columbia University and Johns Hopkins University. Experimentalist in research laboratory, American Bell Telephone Company, 1890-99. Made some investigations in telephony without wires, 1892. Consulting Electrical Engineer and expert for the Ladd Wireless Telephone Syndicate, experimenting on directional signalling, 1899. Retained in 1900 by the Stone Wireless Telephone Syndicate, and in 1902 when the Stone Telegraph and Telephone Company was organised. Author of many scientific papers on wireless. Granted more than 100 U.S. patents in the radio field and a correspondingly large number of foreign patents. Fellow, American Academy of Arts and Sciences. Fellow, American Association for the Advancement of Science, Fellow and Past-President Institute of Radio Engineers. Member or Associate of the following Societies: American Institute of Electrical Engineers; American Electro-Chemical Society; U.S. Navy Institute; Franklin Institute; Mathematics and Physics Club; Boston Scientific Society. His investigations have been principally directed along the lines of eliminating interference in wireless telegraphy.

Swinburne, James, F.R.S.—B. Inverness, February 28th, 1858. Educ. Clifton College. Employed by Messrs. J. W. Swan and Co. (1881) to organise their lamp factory in Paris; later he went on a similar mission to America. Consulting Engineer since 1894, and has attained considerable eminence in various branches of science. As an expert on wireless telegraphy his fame has been recognised by the Government. Member of the Technical Committees considering the Imperial Wireless Scheme, 1912 and 1919-20. Member of various scientific societies, and is on the Council of some. President of the Institution of Electrical Engineers, 1902-3. Addresses: 82, Victoria Street, S.W.1; Woodhurst, Oxted, Surrey.

Swinton, Alan A. Campbell, F.R.S., M.Inst.C.E., M.I.E.E., M.I.M.E., Past-President of the Wireless Society of London.—B. Scotland, 1863. Opened career in 1882 at the Armstrong Works, Elswick. Consulting electrical engineer in London since 1887, having been responsible for the carrying out of many large electrical installations. Chairman of Crompton & Co., Ltd., and director of several electricity supply and engineering manufacturing companies. Associated with the development of the Parsons turbine and other important inventions. Chairman of the Council of the Royal Society of Arts; Chairman of the British Scientific Instruments Research Association; a Member of the Executive Committee of the Board of the National Physical Laboratory; Past President of the Röntgen Society. Member of the Executive Committee of British Science Guild; a Manager of the R. Institution of Great Britain (1912-15). Member of Sub-committee "B" on Atmospherics of Radio Research Board of the Department of Scientific and Industrial Research. Has devoted considerable attention to scientific research, including wireless telegraphy. Address: 66, Victoria Street, Westminster, S.W.1.

Tafur, D. Jose, Col., Spanish Royal Engineers, Director of the Centro Electrotécnico y de Comunicaciones, Madrid. Has the full control of the Wireless Services in the Spanish Army

A member of the Spanish permanent Radiotelegraph Commission. One of the chief contributors of military as well as civil wireless in Spain.

Tesla, Nikola.—B. Smiljan, Sika, Dalmatia, 1857. One of the foremost of the world's electricians. Quite early in life he began to take delight in arithmetic and physics. Graduated Carlstatt, 1873. Devoted his energy to electrical studies and investigations. Went to Gratz, where, at the Polytechnic School, he prepared for work as professor in mathematics and physics. Whilst there he was so struck with the objections to the use of commutators and brushes that he made up his mind to remedy that defect in dynamo-electric machines. Visited America about 1882, where he captured the attention of the whole world with his fascinating experiments on high-frequency electric currents. Since 1890 devoted himself almost entirely to studies of alternating currents of high frequency and very high potentials.

Thoernblad, Thor, Lieut., R. Swedish Engineers.—B. Upsala, Sweden, June 10th, 1885. Pioneer of Wireless Telegraphy in Sweden. His interest in the theory and practice of wireless dates from 1899. Author of the first great Swedish standard work on Wireless Telegraphy, "Traadloes Telegrafi," published 1911. Passed his examination as student at the High School of Stockholm, 1904. Entered the Royal Engineers as Cadet, 1904. Commissioned 1906. Studied mathematics, physics and chemistry 1906-10, first at the Technological Academy of Stockholm, later at the University of Stockholm. By command of the Swedish Government studied Wireless Telegraphy in foreign countries. Devoted considerable attention to the use of wireless on aircraft. Author of a number of articles on radiotelegraphy in the scientific and daily press. Knight of the Order of the Crown of Italy. Address: Strandvägen 7, Stockholm.

Thomson, Sir Joseph John, Kt., O.M., D.Sc. Oxon.(hon.), Dublin, Victoria and Columbia (N.Y.), F.R.S., etc.—B. near Manchester, 1856. Educ., Owen's College; Trinity College, Cambridge. Master of Trinity College, Cambridge, since 1918; Cavendish Professor of Physics, Cambridge, 1884-1918. Has published numerous works, including "Recent Researches in Electricity and Magnetism," 1895; "Discharge of Electricity through Gases," 1897; "Conduction of Electricity through Gases," 1903. Address Trinity College, Cambridge.

Todd, David Wooster, Captain, U.S. Navy, At present Aide to the Commandant, Navy Yard, New York.—B. Round Valley, California, June 29th 1874. Educ. private and public schools in Mich., Nev., and San Francisco. Appointed to Naval Academy, 1891, graduated in June, 1895. Has served at sea on the following vessels of the United States Navy: "Constellation," "Monongahela," "Olympia," "Oregon," "Wheeling," "Rainbow," "Chicago," "Iowa," "Newark," "Denver," "Monterey," "Concord," "Galveston," "Wyoming," "Dixie," and in command of the "Pittsburgh," flagship in European waters; has served ashore as instructor in ordnance, Naval Academy; in charge of Radio Division of Bureau of Steam Engineering, Navy Department, and as Assistant Superintendent of the Radio Service. Attended International Radiotelegraphic Conference, London, 1912, as a delegate. Director Naval Communications, August 3rd, 1916, succeeding Capt. (now Rear-Admiral) W. H. G. Bullard, U.S. Navy. Attended Inter-Allied Radio Conference in Paris upon United States entry into European War, and subsequently organised the American end of the Inter-Allied Transatlantic Radio System. Also organised and directed the United States Cable Censorship, and served on the Censorship Board as Chief Cable Censor. Address: Navy Yard, New York.

Torikata, Dr. Wichi.—B. Japan, 1883. Trained to the profession of Electrical Engineering in the Engineering College of Tokyo Imperial University. Graduated 1906. Devoted himself to the close study of Radiotelegraphy and Telephony, acting at one time as Assistant Engineer to Dr. Osuke Asano, ex-Director of the Electro-Technical Laboratory, and also as Chief Engineer of the wireless section. Inventor and patentee of the Koseki or Mineral Detectors, the T.Y.K. Oscillation Gap for use in Radiotelephony, and the Wave Telephony superposed on electric power transmission line. The late Mikado of Japan recognised his services by awarding him the Fifth Degree of Decoration, bestowing this honour specifically for his services in connection with Wireless Detectors, whilst the Ruling Emperor has presented him with the Fourth Degree of Decoration on account of his Radio Researches. The Senate of Tokyo University marked their appreciation of his efforts by bestowing upon him in 1915 the title of "Dr. Engineer." Has received many prizes for technical work, including the First Medal of the Japanese Electric Engineers' Society (established 1888), and Academy Prize and Medal granted by the Japanese Imperial Academy. He took his position after the resignation of Dr. M. Tonegawa, ex-Director. Address: No. 2801 Sanno, Omori, near Tokyo.

Travailleur, Maurice.—B. Brussels, 1871. Graduated as engineer at Brussels University, 1893. Appointed Electrical Engineer to the late King of the Belgians, 1897. One of the founders of Internationale Société Anonyme, the Marconi International Marine Communication Co., Ltd. Managing Director of the Société Anonyme Internationale de Télégraphie sans Fil, and Chairman of the Société Nationale Radio-électrique, both in Brussels.

Tsiang Tseng-yi.—Native of the Haining District of the Chekiang Province. Acquired the third degree of Literature at the Metropolitan Examination in Peking, 1904, and appointed Junior Clerk of the Board of Revenues. Soon afterwards transferred in the same rank to the Board of Communications (then known as Yuchuanpu) by its special recommendation for dealing with telegraph matters. Chinese telegraphs were then administered partly by a commercial company and partly by the provincial viceroys and governors. Mr. Tsiang proposed that all the commercially and provincially owned telegraph lines be nationalised and placed under the direct control of the Yuchuanpu. This proposal received the approval of the Government, and was put into operation. In 1911, as Commissioner of Telegraphs of the Yuchuanpu, he caused two powerful radio stations to be established, one in Peking and the other at Nankin. Since their establishment the wireless service has been greatly improved and extended to such localities as Shanghai, Woosung, Foochow, and Canton, along the coasts, and Kalgan and Wuchang in the interior. Both the Ministries of War and Navy have followed in the steps of the Ministry of Communications by installing radio stations for their respective purposes. Mr. Tsiang served over ten years in the telegraph service, holding the following important positions:

1910-11, Commissioner of Telegraphs of the Yuchuanpu; 1913-16, Chief of the Financial Department of Telegraphs, Posts and Navigation. Acted as Chief of the Telegraph Department and Director-General of Telegraphs of the Ministry of Communications, and Chairman of the Chinese Society of Electrical Science.

Turner, Laurence Beddome, M.A., M.I.E.E.—B. 1886. Educ. Bedford Grammar School and King's College, Cambridge (1904). First-class honours in Mechanical Sciences Tripos in 1907. Spent 1907-08 in research work at the C.U. Engineering Laboratory, receiving in 1908 the award of the University "John Winbolt Prize" for an essay on this research. After a year in the workshops and drawing office of Messrs. Siemens Bros. at Woolwich and Siemens u. Halske A.G. at Berlin, entered in 1910 the Engineer-in-Chief's office of the G.P.O. Engaged there in W/T experimental work, and in the design and installation of new ship-and-shore stations. Attached to the Army Signals Experimental Establishment at Woolwich 1916, where he designed wireless field apparatus, including the Infantry "Loop Set." Fellow and Lecturer of King's College, Cambridge, 1919. Member of the Imperial Wireless Telegraphy Committee, 1919. Author of "Outline of Wireless," 1921. Address: King's College, Cambridge.

Turner, Samuel, A.M.I.E.E., A.F.Ac.S., A.F.Aer.S., M.I.Radio.E.—Educ. Barrow-in-Furness Sec. and Tech. Coll., under G. Grace, D.Sc., etc. Two years' works training at Messrs. Vickers, Maxim, Barrow. Appointed to post in Telephone Research Labs., London. Subjects included Telephony and Telegraphy, Valves and Valve Circuits, Telephone Transmission, High-Frequency Measurements, Automatic Telephony, etc. Lecturer and Instructor to R.F.C. W/T Officers at Brooklands (under Major Prince) in W/Telegraphy and Telephony applied to Aircraft December, 1915—Oct., 1917. Research work in W/Telephony, C.W., etc. (using Triode valves) at R.F.C. W/T Exper. Station, Biggin Hill and Woolwich (1917-18). Transferred to Air Ministry to develop and supervise Technical Section. Resumed civilian research work July, 1919. Inventions: Devices for W/Target Training of Pilots, Observers, etc. Publications: Papers (London Telephone Society). Articles: "Electrician" (and other papers), and I.C.S.; Textbook on Automatic Telephony, etc. Address: 31, Belsize Square, N.W.3.

Turpain, Professor Albert.—B. La Rochelle, December 2nd, 1867. Employed in the Department of Posts and Telegraphs of France, 1884-87. Licentiate in physical science, 1888. Licentiate in mathematics, 1891. Obtained doctorate of science, 1889. As tutor of physics at the Faculty of Science, Bordeaux, succeeded in sending messages without wires from an equipment erected in the college buildings. Has experimented in wireless telegraphy with successful results for many years. Applied himself to the question of tuning and (1899) experimented with a means for determining the direction of electro-magnetic waves. Resumed these experiments 1912. Succeeded in obtaining graphic records of time signals by means of a micro-amperemeter over a distance of 300 km. between Poitiers and Paris, 1911. Carried out successful experiments in photographically recording wireless telegraph signals which passed between Paris and Poitiers.

Vallauri, Giancarlo.—B. Rome, 1882. Educ. in the classical schools of Italy. Entered the Royal Naval Academy. Appointed officer of the Royal Italian Navy, 1903. After a few years at sea he quitted the active naval service and joined the Polytechnic School in Naples, obtaining the diploma of engineer and the electrotechnic diploma, 1907. Since conducted electrical tuition in the Polytechnic Schools of Padua, Karlsruhe and Naples. Connected with many industrial electric establishments and placed his services at the disposal of the Royal Navy for the installation of wireless stations. Inaugurated at the Polytechnic School in Naples a course in Wireless Telegraphy 1912, and supervised that subject till the end of 1916, with an interruption for service at sea during the first two years of the great war, when he was called to the direction of the Institute of Electricity and Wireless Telegraphy of the Royal Navy by the Royal Naval Academy in Leghorn. His attention has mainly been turned to the study of ferro-magnetic phenomena, to which he has made important contributions. Has published a series of papers on Ionic Valves, and on radiation measurements, which has won wide publicity and appreciation. Address: R. Accademia Navale, Leghorn, Italy.

Van der Bijl, Dr. H. J.—Scientific and Technical Adviser Bureau of Mines and Industries, Union of South Africa. Educ. Victoria College, British South Africa, and University of Leipsic, where he gained his doctorate. Visited United States, 1913, and joined Engineering Department, Western Electric Company. Instrumental in devising several improvements in Telephone and Telegraph instruments. Figured prominently in the development of the Vacuum Tube, and ranks among the leading authorities on thermionics. Address: Scientific and Technical Adviser, Bureau of Mines and Industries, Pretoria, S.A.

Van der Pol, Balth, Jun., D.Sc., Director of Physical Research Laboratory, Teyler's Institute (Haarlem).—B. January 27th, 1889, at Utrecht (Holland). Educ. at Utrecht, graduating as *Candidaat* in the University (1914), and as *Doctorandus* (1916). Studied Experimental and Theoretical Physics, under Professors Julius and Ornstein. His interest in the theory and practice of wireless dates from 1904. Came to England in 1916 to study under Professor J. A. Fleming. Proceeded to Cambridge in 1917, working under Professor Sir J. J. Thomson, at the Cavendish Laboratory for about eighteen months. He is author of a number of valuable monographs upon physical and radiotelegraphic subjects. Appointed Conservator and placed in charge of the physical research laboratory of Teyler's Institute, Haarlem (Holland). In April, 1920, he took his doctor of science degree at the Utrecht University *cum laude* on a thesis on the propagation of electro-magnetic waves through an ionised gas. He is one of the founders of the Dutch Radio Institute, of which society he is vice-president. He is now engaged on research work in the above mentioned laboratory with Professor H. A. Lorentz. Address: Physical Laboratory, Teyler's Institute, Haarlem, Holland.

Vanni, Dr. Giuseppe.—B. Albano Laziale (Rome) in 1862. Graduated in science 1887. Went to Strassburg 1890, where, under Professor Kohlrausch, of the Physical Institute, he studied electrical measurements. Appointed to teach physics at the Collegio Romano, Rome, 1894. Nominated professor and director of the physical laboratory of the Military Radiotelegraphic Institute in Rome, 1912. Took part in the International Radiotelegraphic Conference of London, 1912, as a member of the Italian delegation, and also at the Conferences held in Paris in

1912 and 1913. His works are principally concerned with electrology, electrical engineering, and electrical waves. By means of an hydraulic microphone of his invention made interesting experiments in wireless telephony between Rome and Tripoli (1,000 km.) and between Rome and Treviso (420 km.), and in 1914 his paper on the "Progress and Actual State of Wireless Telegraphy and Telephony" gained the Cagnola Prize of the Royal Lombard Institute of Science and Literature in Milan. Address: Rome, Military Radiotelegraphic Institute, Viale Mazzini 10.

Vyvyan, R. N.—Educ. at Charterhouse. Received electrical and engineering training Faraday House. Joined Marconi's Wireless Telegraph Co., 1900. Built Poldhu Wireless Station, subsequently proceeding to Canada as Managing Engineer until 1908. In the course of his work visited most European countries and also South Africa and America. Responsible for design and construction of most of the high-power stations erected by the Marconi Company, including naval strategic stations and others erected for the Admiralty early in the late war. Joined R.F.C., 1916, and served in France. Later sent to America as member of the British War Mission. Demobilised early 1919, since when Superintending Engineer of the Marconi Company. In charge of the design, construction and management of all wireless stations owned or erected by that company. Address: Marconi House, Strand, W.C.2.

Wade, C. F. Newton, A.M.I.Rad.E., Postmaster-General and Superintendent of Land and Radio Telegraphs, British North Borneo.—B. Shepton Mallet, Somerset. Five years with Messrs. Siemens Bros. & Co., at Woolwich, as Radio Engineer, during which time he was employed on extensive experiments on earth telegraphy, earthed and buried aerials and transmission of high-frequency currents along wires, in addition to ordinary experimental, designing and testing work in connection with Radio apparatus. Superintendent of Government Radiotelegraphs, British North Borneo, 1918. Postmaster-General and Superintendent of Land Telegraphs in addition in January, 1920. Address: Jesselton, British North Borneo, and Intake, Sheffield, Yorks.

Walter, L. H., M.A., A.M.I.E.E.—B. London, 1870. Educ. private schools in England, at Hanover, Germany, Trinity College, Cambridge (1894-98), where he took honours in Natural Sciences. Later carried out research work in the University Engineering Laboratory. Experimental assistant to Sir Hiram S. Maxim. Editor of "Science Abstracts," 1903, when that publication was taken over by the Institution of Electrical Engineers, which position he still holds. Author of "Direction and Position Finding" (Pitman), 1921. Inventor of several forms of detectors of electrical oscillations, and for his magnetic type of oscillation galvanometer was awarded the John Scott Medal. In 1905 he drew attention to the advantages of directive wireless telegraphy and, associating himself with Captain Tosi and Dr. Bellini, he introduced the directive system and the wireless compass into England. Address: Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2, and 23, Park Mansions, Battersea Park, S.W.11.

Weagant, Roy A.—B. Morrisburg, Ontario, Canada, 1881. Educ. Stanstead College, Stanstead, Quebec, Canada, and McGill University, Montreal, Canada. Graduated from Electrical Engineering Course, 1905. Studied Physics under Sir Ernest Rutherford and first became interested in wireless through witnessing some of his experiments in Hertzian waves. Gained engineering experience with the Montreal Light, Heat, and Power Company, the Westinghouse Electric Manufacturing Company of Pittsburg, Pa., and the De Laval Steam Turbine Company. Took up commercial wireless work in 1908. Entered service of the Marconi Wireless Telegraph Company of America, 1912, where he soon rose to the position of Chief Engineer. Appointed, 1920, Consulting Engineer, Radio Corporation of America. Fellow of the Institute of Radio Engineers and former member of its Board of Directors and Standardisation Committee. Inventor of a novel method of eliminating static interference. Awarded Liebmann Memorial Prize for 1920. Address: Douglas Manor, Long Island, New York.

Whiddington, Richard, M.A., D.Sc., Professor of Physics, University of Leeds.—B. November 25th, 1885, in London. Educ. at St. John's College, Cambridge, where after taking degree in 1908, he undertook research work under Professor Sir J. J. Thomson at the Cavendish Laboratory. Elected Fellow of St. John's College, 1911. In September, 1914, went to Royal Aircraft Factory, Farnborough, to design aircraft wireless apparatus for the Flying Corps. Received first commission in Army in 1915, leaving Farnborough soon after. During the war designed a number of the standard R.A.F. wireless sets and assisted on the W/T Board and Inter-Allied W/T Commission in Paris. Demobilised with rank of major, June, 1919. Has published a number of original papers on various electrical subjects. Member of Sub-Committee "D" on Thermionic Valves, of Radio Research Board, of the Department of Scientific and Industrial Research. Address: Leeds University.

Whitmore, G. Scovell.—B. Dawlish, 1881. Educ. St. Andrew's College, Dublin. Served under Eastern Telegraph Company, Ltd., at Porthcurnow and Malta cable stations. Entered Heaton works of Sir C. A. Parsons & Co., 1902, and became Chief Assistant to the Engr. and Gen. Manager of Northern Counties Electricity Supply Co., Ltd., in 1906. Joined the engineering staff of Marconi's Wireless Telegraph Co., Ltd (1909), and appointed (1910) Managing Engr. at the Transatlantic W/T Station, Glace Bay, Canada. Since 1912 employed at the head office of Marconi's Wireless Telegraph Co., Ltd., mainly in connection with the construction and maintenance of high-power W/T stations, occupying the position of Act. Suptdng. Engr. August, 1916—March, 1919, during absence of the Suptdng. Engr. on military service.

Wibier, Albert, Lieut.-Col.—B. at Renaix, East Flanders, June 3rd, 1876. Organised and controlled the wireless service of the Belgian Army during the late war. In 1911 he installed and has since directed the wireless service of the Belgian Congo, holding the position of Director-General of that organisation. Address: 11, Rue de la Reinette, Brussels, Belgium.

Wien, Professor Max.—B. Königsberg, 1866. Made a special study of the subject of physics under Helmholtz and others, and assisted Rontgen, 1891-93. Devoted considerable attention to the study of electro-magnetic waves and their propagation, and was the originator of the quenched spark.

Wilson, Ernest, M.Inst.C.E., M.I.E.E.—Professor of Electrical Engineering, King's College, London, since 1898; Fellow of King's College and Dean of the Faculty of Engineering. Address King's College London W.C.2

Wilson, Brig.-Gen. Samuel Herbert, C.B. (1918), **C.M.G.** (1914); Officier Legion d'Honneur; French Croix de Guerre; Commandeur de la Couronne, Belgium; Belgian Croix de Guerre.—B. 1873. Entered Army, R.E., 1893 Captain 1904, Major 1913, Bt. Lt.-Col. 1916 Bt. Col. 1917. Served S. Africa, 1899-1900 (Queen's Medal with two clasps). Served great war, 1914-18; General Staff Officer, 2nd Grade, 1911-15; General Staff Officer, 1st Grade, 1915-16; Brig.-Gen. General Staff, 1916. Principal Assistant Secretary, Committee of Imperial Defence and Head of Imperial External and Defence Branch Cabinet Secretariat. Secretary Imperial Communications Committee; Wireless Telegraphy Committee; Overseas Defence Committee; Home Ports Defence Committee. Address: 22, Stanford Road, Kensington, W.8. (Tel. 5049 Western); and Heath Cottage, Puttenham, Surrey.

Wilson, Hamilton William, M.I.E.E.—B. 1878. Educ. Collegiate School, Wanganui, New Zealand. Apprenticed to Cable & Co., Marine Engineers, Wellington, N.Z. Electrical and Mechanical Engineering Courses at King's College, Strand, London, 1901 to 1904. Assistant Engineer to Metropolitan Electrical Supply Co. Ltd., London, 1904 to 1906. Chief Assistant Electrical Engineer and part time acting Electrical Engineer to East India Railway Co., Bengal, India, 1906 to 1908. Electrical Engineer to John Birch & Co. Ltd., London Wall, London, 1910 to 1911. Secretary and Director of The Wilson Apparatus Co. Ltd., Carlisle, 1911 to 1913. In private practice since 1913 as Electrical Engineer and Inventor, at Kingston Hill. Inventor of various wireless telegraph appliances and X-ray apparatus. Designed some of the earliest transformers and apparatus used for Army Aircraft Wireless, etc., before 1912. Designed and manufactured transformers, wireless telegraph condensers, and transmitting sets used in large numbers during the War by War Office, Admiralty and Royal Air Force. Joint author of various papers in "The Electrician," etc. Author of paper before Royal Society on Ruhmkorff Coils, and paper before Physical Society of London on construction of Thermo-Electric Appliances.

Yagi, Professor Hidetsugu, Professor of Electrical Engineering at the Tohoku Imperial University and Member of the Institute of Radio Engineers.—B. Osaka, January, 1886. Graduated from the Tokyo Imperial University, 1909. Lecturer and later Professor of Electrical Engineering at the Sendai Higher Technical School. Afterwards Professor of the Tohoku Imperial University. Studied in Dresden, London, and Harvard, 1913-16, engaging at the same time in several researches on radio frequency phenomena. Author of many scientific papers.

Yokoyama, Eitaro.—B. 1883. Graduated Engineering College of the Tokyo Imperial University, 1908. Radio Engineer to Ministry of Communications, Japan. Engages in radio researches at the Electro-Technical Laboratory of the Ministry. One of the inventors of T.Y.K. Oscillation Gaps of Radiotelephony. Awarded by the Ruling Emperor with the Fifth Degree of Decoration. Granted many prizes for his wireless investigations and inventions, including the Academy Prize and Medal of Japanese Imperial Academy. Proceeded to America and Europe to study, 1916. Returned to Japan, 1918, and resumed service at the same Laboratory. Promoted to the Head of the Radio Section of the Laboratory, 1920. Holds additional posts as Engineer to the Formosan Government and Lecturer of the Tokyo Higher Technical School. Private address: Kiharayama 1523, Omori, Tokyo.

Zenneck, Professor, Dr. J., Professor of Experimental Physics at the Institute of Technology, Munich.—B. April 15th, 1871, in Wurtemberg. Studied for four years in a Theological College at Tubingen. Abandoning theology, studied mathematics and natural history, particularly zoology, 1889-94. Passed the State examination in these subjects, 1894. Obtained his doctorate, 1894. Studied natural history in London and elsewhere. Subsequently devoted himself entirely to physics. Assistant in the Physical Institute in Strassburg, 1895-99. Engaged in making tests with wireless telegraphy in the North Sea, 1899-1900. Lecturer, Assistant Professor of Physics in the Technical College, Dantzic, 1905. Professor of Physics at the Technical College, Brunswick, 1906. Joined one of the largest chemical works in Germany, 1909. Professor of Physics at the Institute of Technology, Dantzig, 1911, Munich, 1913. During part of the war Technical Adviser to the Atlantic Communication Co., which then operated Sayville wireless station. Address: Technische Hochschule, Munchen, Germany.

OBITUARY.

SINCE we went to Press with our last edition, the world of wireless has had to mourn the loss of two prominent men.

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On May 17th, 1921, the death occurred, in New York, of **DR. EDWARD BENNETT ROSA,** Chief Physicist of the United States Bureau of Standards. Dr. Rosa, who was born in 1861, carried out many notable researches in electricity, and during the war was responsible for valuable improvements in aircraft and directional wireless used by the American forces in France.

We regret to have to record the death, resulting from a railway accident on September 19th, 1921, of **COLONEL THOMAS THOMASSEN HEFTYE,** Director-General of Norwegian Telegraphs. Colonel Heftye was born in 1860, and was educated at the University at Christiania. After a business career lasting five years, he entered the Army, being gazetted to the Corps of Royal Engineers. It was in 1905 that he became intimately connected with wireless telegraphy, on his appointment as Director of Telegraphs. Realising from the first the value of a national wireless system, Colonel Heftye strenuously advocated the establishment of the present efficient organisation in Norway.

LITERATURE
: SECTION :

(A) New Radio Books dealing with Wireless

(B) Résumé of Articles published in 1921

(C) Standard Publications on Wireless :—

(i) Books.

(ii) Periodicals.

LITERATURE OF WIRELESS TELEGRAPHY AND TELEPHONY

THE literature of radiotelegraphy and telephony increases year by year, and has now reached the stage when we consider that our readers will find it useful to have a record of the various items which have appeared during the past year, not merely in the shape of books, but also of periodical publications. The *résumé* which finds a place below covers only the more important of such items as deal directly with the subject of this volume; for works and papers on the more general subjects we must refer readers elsewhere.

(A) NEW BOOKS DEALING WITH WIRELESS.

The Wireless Experimenter's Manual, Incorporating How to Conduct a Radio Club. Elmer E. Bucher. [New York: *Wireless Press Inc.* 1920. Pp. 335. Price 12s. 6d. net.]

Report of the Chief Signal Officer of the U.S. Army to the Secretary of War, U.S.A., 1920. [Washington: *Government Printing Office.* 1920. Pp. 64.]

Report of the Director of the Air Service to the Secretary of War, U.S.A. [Washington: *Government Printing Office.* 1920. Pp. 40.]

Radio Questions and Answers. A. R. Nilson. [New York: *McGraw-Hill Book Co., Inc.* London: *McGraw-Hill Publishing Co., Ltd.*, 6-8, Bouverie Street, E.C.4. 1022. Pp. 92. Price 5s. net.]

Experimental Wireless Stations. Philip E. Edelman, E.E. [London: *Henry Frowde and Messrs. Hodder & Stoughton.* Revised Edition, 1920. Pp. x+392. Price 16s. net.]

The Electrician's Handy Book: A Reference Book for the Advanced Electrician, and a Text-book for the Student. T. O'Conor Sloane, A.M., E.M., Ph.D. [London: *Henry Frowde and Messrs. Hodder & Stoughton.* Fifth edition, 1920. Pp. 823. Price £1 7s. 6d. net.]

Wireless Design and Practice: Part I., Transmitters and Receivers. Part II., Practical Circuits. M. B. Sleeper. [London: *Henry Frowde and Messrs. Hodder & Stoughton.* 1920. Pp. 246. Price 7s. 6d. net.]

Longueurs d'onde et Propagation. M. Vieillard. [Paris: *Gauthier-Villars et Cie.* 1921. Pp. xii+416. Price 55 fr.]

High-Frequency Apparatus. Thomas S. Curtis. [London: *Page & Co.* 1921. Pp. 260, with 150 diagrams. Price not stated.]

Wireless Telegraphy: With Special Reference to the Quenched Spark System. B. Leggett, A.M.I.E.E. [London: *Chapman & Hall, Ltd.* 1921. Pp. xv+485. Price 30s. net.]

Modern High-Speed Influence Machines, their Principles, Construction, and Applications to Radiography, Radiotelegraphy, Spark Photography, Electro-Culture, Electro-Therapeutics, High-Tension Gas Ignition, the Testing of Materials, etc. V. E. Johnson, M.A. [London: *E. and F. N. Spon, Ltd.* 1921. Pp. viii+278. Price 14s. net.]

Notions Elémentaires de Télégraphie sans Fil et Construction Pratique de Postes Récepteurs. (Ondes Amorties et Entretenues.) Jean Remaur. [Paris: *Librairie Générale Scientifique et Industrielle Desforges.* 1921. Pp. 116. Price 7 fr. 50.]

Continuous Wave Wireless Telegraphy. W. H. Eccles, D.Sc. [London: *The Wireless Press, Ltd.* 1921. Pp. vii+407, with 306 diagrams. Price 25s. net.]

Arithmetic of Telegraphy and Telephony. T. E. Herbert and R. G. de Wardt. [London: *Sir Isaac Pitman & Sons, Ltd.* 1921. Pp. vii+187. Price 5s. net.]

Einfuhrung in die Elektrotechnik unter Zugrundelegung der Vorlesungen. Professor Slabys. Revised by Otto Nairz. [Leipzig: *J. A. Barth.* Pp. viii+415. Price M.25·20.]

Wireless Telegraphy and Telephony: An Outline for Electrical Engineers and Others. L. B. Turner, M.A., M.I.E.E. [London: *The Cambridge University Press.* 1921. Pp. xii+195. Price 20s. net.]

A Catalogue of British Scientific and Technical Books. Prepared by a Committee of the British Science Guild. [London: *The British Science Guild.* 1921. Pp. xviii+376. Price 10s. net.]

The Signal Service in the European War of 1914-1918 (France). By R. E. Priestley, M.C., B.A. (late Major, R.E.). Published by the Secretary of the Institution of Royal Engineers, and by the Signals Association. [Chatham: *W. & J. Mackay & Co., Ltd.* 1921. Pp. xvi+359. Price not stated.]

The Admiralty Handbook of Wireless Telegraphy, 1920. [London: *H.M. Stationery Office.* 1920. Pp. viii+477. Price 7s. 6d. net.]

Het Draadloos Zendstation Voor Den Amateur (Telegrafie en Telefonie). J. Corver. ['s-Gravenhage: *N. Veenstra.* 1920. Pp. 106. Price not stated.]

Electricity at High Pressures and Frequencies. H. L. Transtrom. [Chicago: *The Joseph G. Branch Publishing Co.* Second Edition, 1921. Pp. xi+247. Price $2.50.]

The Thermionic Vacuum Tube and its Applications. H. J. van der Bijl. [New York: *McGraw-Hill Book Co., Inc.* London: *McGraw-Hill Publishing Co., Ltd.* 1921. Pp. 391. Price 30s. net.]

Die Neuere Entwicklung der Funkentelegraphie ein Siegeszug der Vakuumrohre. Dr. H. Wigge. [Cothen-Anhalt: *Verlag der Ingenieur-Zeitung.* Second edition. 1921. Pp. v+71. Price not stated.]

Principles of Radio Communication. J. H. Morecroft (Assistant Professor of Electrical Engineering, Columbia University), assisted by A. Pinto and W. A. Curry. [New York: *John Wiley & Sons, Inc.* London: *Chapman & Hall, Ltd.* 1921. Pp. x+935. Price 45s. net.]

Thermionic Tubes in Radiotelegraphy and Telephony. John Scott-Taggart, A.M.Am.I.E.E. [London: *The Wireless Press, Ltd.* 1921. Pp. xxiii+424, with 344 diagrams. Price 25s. net.]

The Alexanderson System for Radio Telegraph and Radio Telephone Transmission. Elmer E. Bucher. [New York: *Wireless Press, Inc.* London: *The Wireless Press, Ltd.* Pp. 55. Price 10s. 6d. net.]

Les Tubes à Vide. P. Dapsence. [Paris: *G. Pericaud.* Second edition, 1921. Pp. 49. Price 2.50 fr.]

Radiotelefonia. D. Ravalico. [Turin: *S. Lattes & C.* 1920. Pp. vii+219. Price L.14.]

La T.S.F. par les Tubes à Vide. P. Louis. [Paris: *Librairie Vuibert.* 1920. Pp. 143. Price 6 fr.]

Le Livre de l'Amateur de T.S.F. J. Roussel. [Paris: *Librairie Vuibert.* 1921. Pp. vi+304. Price 15 fr.]

Appareils et Installations Télégraphiques. E. Montoriol, with a Preface by M. Blondel. [Paris: *Librairie J. B. Baillière et Fils.* 1921. Pp. 625, with 440 figures. Price 40 fr.]

De Internationale Organisation van het Radio-Electrische Verkeer. C. F. van Dissel. [Leiden: *A. W. Sitjthoff's Uitgeversmaatschappij.* Pp. 48. Price fl. 0·50.]

Fifty Years of Electricity. J. A. Fleming, M.A., D.Sc., F.R.S. [London: *The Wireless Press, Ltd.* 1921. Pp. xi+371. Price 30s. net.]

Nouveau Traité Pratique de T.S.F. P. le Graverand. [Paris: *G. Pericaud.* Eighth edition. Pp. 80. Price 2 fr.]

Wellentelegraphie. Hanns Gunther. [Stuttgart: *Franckh'sche Verlags-handlung.* Pp. 112. Price M. 6·60.]

Télégraphie et Téléphonie sans fil. C. Gutton. [Paris: *Librairie Armand Colin.* Pp. 188. Price 5 fr. Paper covers. Bound 6 fr.]

Einführung in die moderne drahtlose Telegraphie und ihre praktische Verwendung. Hugo Mosler. [Braunschweig: *Friedrich Vieweg und Sohn.* 1920. Pp. 240, with 218 figures. Price M. 24.]

La direction des avions par Télégraphie sans fil. M. Percheron. [Paris: *Librairie Ernest Leroux.* Pp. 60. Price 2 fr.]

Radiotelegraphisches Praktikum. H. Rein and K. Wirtz. [Berlin: *Julius Springer.* Second Edition, 1921. Pp. xxiii+557. Price M. 120.]

Radiotelefonia Espanola. Rufino Geay Sacasa [Madrid: *El Telegrafo espanol.* Pp. 56. Price 4 pesetas.]

Prepared Radio Measurements with Self Computing Charts. Ralph R. Batcher, E.E. [New York: *Wireless Press Inc.* London: *The Wireless Press, Ltd.* 1921. Pp. 132, Price 10s. 6d. net.]

La Théorie et la Pratique des Radiocommunications—II. La Propagation des Ondes Electromagnétiques à la Surface de la Terre. Léon Bouthillon. [Paris: *Librairie Delagrave.* 1921. Pp. xv+340, with 133 figures. Price 20 fr.]

Directive Wireless Telegraphy, Direction and Position Finding, etc. L. H. Walter, M.A., A.M.I.E.E. [London: *Sir Isaac Pitman & Sons, Ltd.* 1921. Pp. xii+124, with 57 diagrams and illustrations. Price 2s. 6d. net.]

The Framework of Wireless Telegraphy: A new Theory of Electric Wave Sources and Propagations with Rational Applications. R. C. Galletti di Cadillhac. [London: *Crosby, Lockwood & Son.* 1921. Pp. 48, with 6 diagrams. Price 3s. 6d. net.]

(B) RÉSUMÉ OF ARTICLES PUBLISHED DURING 1921

A complete list of all articles dealing with wireless would occupy too much space in a volume of this character. A review of radio literature is now being issued monthly in the pages of *The Radio Review*, so that a complete list of such articles as are published month by month, with abstracts of their contents, is now available. The following list, therefore, merely contains references to the most important only of the technical articles that have appeared since our last edition, or which were inadvertently omitted from the list there given These are roughly classified under separate headings, but it should be noted that in many cases articles may refer to more than one branch of the subject. This is particularly the case with articles dealing with valves, which have applications in almost every branch of radio work.

RADIO FREQUENCY MEASUREMENTS AND THEORY.

Damped Electric Oscillations. R. B. Abbott. [*Physical Review,* 17, pp. 482-492, April; pp. 510-511, April, 1921.]

Direct Reading Apparatus for the Measurement of Alternating Currents: the Amplifying Voltmeter. H. Abraham, E. Bloch and L. Bloch. [*Journal de Physique et la Radium,* 1, pp. 44-57, August, 1920.] Also. H. Abraham. [*Annales des Postes, Télégraphes et Téléphones,* 9, pp. 107-207, June, 1920.]

A Law Regarding Antenna Models. M. Abraham. [*Jahrbuch Zeitschrift für drahtlose Telegraphie,* 16, pp. 67-70, July, 1920.]

Magnetic Losses at High Frequency. E. F. W. Alexanderson. [*Electrical World*, 77, p. 163, January 15th, 1921.]

The Wave-Front Angle in Radiotelegraphy. L. W. Austin. [*Journal of the Washington Academy of Sciences*, 11, pp. 101-106, March 4th, 1921.]

Determination of the Direction of Atmospheric Disturbances or Static in Radiotelegraphy. L. W. Austin. [*Journal of the Franklin Institute*, 171, pp. 617-629, May, 1921.]

The Application of the Austin-Cohen Formula to the Solution of Some Important Problems of Radiotelegraphic Transmission. [*Jahrbuch Zeitschrift für drahtlose Telegraphie*, 16, pp. 114-125, August, 1920.]

Triple Pendulums with Mutual Inter-action and the Analogous Electrical Circuits. E. H. Barton and Miss H. M. Browning. [*Philosophical Magazine*, 40, pp. 611-618, November, 1920.]

Three Magnetically-Coupled Circuits. E. Bellini. [*Electrician*, 85, p. 78, July 16th, 1920.]

On the Influence of Antenna Height on the Range of Wireless Stations. J. Bethenod. [*Radioélectricité*, 1, p. 285, November, 1920.]

On the Effective Capacity and Resistance of a Condenser for High Frequency Currents. F. C. Blake. [*Physical Review*, 16, pp. 540-557, December, 1920.]

On Electrostatic Transformers and Coupling Coefficients. F. C. Blake. [*Journal of the American Institute of Electrical Engineers*, 40, pp. 23-29, January, 1921.]

The Effect of Modulation Wavelength upon Received Signals. A. S. Blatterman. [*Radio Review*, 2, pp. 144-151, March; pp. 187-197, April, 1921.]

A New Method of Calculation by the Separation of Power, Applicable to Radiotelegraphy, P. Boucheron. [*Radioélectricité*, 1, pp. 73-81, July 1920.]

On the Charging of Condensers by an Alternating E.M.F. and their Discharge through a Spark Gap. An Investigation of the Conditions for the Production of a Musical Note. L. Bouthillon. [*Radioélectricité*, 1, pp. 286-291, November, 1920; pp. 448-454, February, 1921; pp. 533-546 April, 1921.]

Skin Effect on Round Wires. C. Breitfeld. [*Elektrotechnik und Machinenbau*, 38, pp. 537-543, November, 1920.]

Wireless Telegraphy in Space. W. Burstyn. [*Jahrbuch Zeitschrift für drahtlose Telegrahpie*, 16, pp. 322-337, November, 1920.]

Coupling Phenomena with Undamped Oscillations. W. Burstyn. [*Elecktrotechnische Zeitschrift*, 41, pp. 951-954, December 2nd, 1920.]

Wave Propagation over Parallel Wires: the Proximity Effect. J. R. Carson. [*Philosophical Magazine*, 41, pp. 607-633, April, 1921.]

Theory and Calculation of Variable Electrical Systems. J. R. Carson. [*Physical Review*, 17, pp. 116-134, February, 1921.]

The Composition, Ionisation and Viscosity of the Atmosphere at Great Heights. S. Chapman and E. A. Milne. [*Quarterly Journal of the Royal Meteorological Society*, 46, p. 357, 1920.]

The Theory of Linear-sinoidal Oscillations. H. G. Cordes. [*Physical Review*, 16, pp. 179-201, September, 1920.]

Current Suppression by Means of Parallel Resonance. H. G. Cordes. [*Radio Review*, 2, pp. 358-370, July, 1921.]

An Integration Method of Deriving the Alternating Current Resistance and Inductance of Conductors. H. L. Curtis. [*Bureau of Standards Scientific Paper*, No. 374, April 7th, 1920; *Bulletin of the Bureau of Standards*, 16, pp. 93-124.]

A Sensitive Valve Method for the Measurement of Capacity. J. J. Dowling. [*Proceedings of the Dublin Royal Society*, 16, pp. 175-184, December, 1920.]

The Capacitance of Flat Top Antennae. W. H. Eccles. [*Electrician*, 86, p. 72, January 14th, 1921.]

Inaugural Address to the Wireless Section of the Institution of Electrical Engineers. W. H. Eccles. [*Journal of the Institution of Electrical Engineers*, 59, pp. 77-84, December, 1920; *Radio Review*, 2, pp. 31-37, January, 1921.]

Some Thermionic Tube Circuits for Relaying and Measuring. W. H. Eccles and Miss W. A. Leyshon. [*Journal of the Institution of Electrical Engineers*, 59, pp. 433-438, April, 1921.]

The Effect of the Heaviside Layer on the Apparent Direction of Electromagnetic Waves. T. L. Eckersley. [*Radio Review*, 2, pp. 60-65, February; pp. 231-248, May, 1921.]

The Mutual Inductance of Single Turn Rectangles and Squares. A. Esau. [*Anallen der Physik*, 61, pp. 151-154, August, 1920.]

The Calculation of the Self and Mutual Inductance of Coils. A. Esau. [*Radio Review*, 1, pp. 763-768, December, 1920.]

Coil Aerials: their Inductance, Capacity and Natural Frequencies. A. Esau. [*Jahrbuch Zeitschrift für drahtlose Telegraphie*, 16, pp. 162-190, September, 1920.]

Radiogoniometric Investigations. G. Ferrié, R. Jouaust, R. Mesny, and A. Perot. [*Comptes Rendus*, 172, pp. 44-57, January 3rd, 1921.]

A High-Frequency Resistance Standard. J. G. Frayne. [*Physical Review*, 17, pp. 415-416, March, 1921.]

The Permeability of Nickel at High Frequencies. R. Gans and R. G. Loyarte. [*Annalen der Physik*, 64, pp. 209-249, February 9th, 1921.]

Natural Frequency and Harmonics of Single Layer Coils. E. Geiss. [*Annalen der Physik*, 64, pp. 377-400, February 14th, 1921.]

The Calibration of Thermo-Junctions as A.C. Ammeters. W. Gereach. [*Physikalische Zeitschrift*, 21, pp. 550-551, October 15th, 1920.]

Capacity Effects in High-Frequency Measurements. E. Giebe and E. Alberti. [*Jahrbuch Zeitschrift für drahtlose Telegraphie*, 16, pp. 242-251, October, 1920.]

A Method of Measuring the Specific Inductive Capacity of Air. E. W. B. Gill. [*Radio Review*, 2, pp. 450-454, September, 1921.]

On the Measurement of Changes in Resistance by a Valve Method. R. T. Beatty and A. Gilmour. [*Philosophical Magazine*, 40, pp. 291-295, September, 1920.]

The Transmission of Wireless Signals between Toulon and Tahiti. M. Guierre. [*Bulletin Société Française des Électriciens*, 10, pp. 247-268, July, 1920; *Radio Review* 2, pp. 618-635, December, 1920.]

The Standardisation of Antenna Ammeters. J. Guinchant. [*Radioélectricité*, 1, pp. 441-442, February, 1921.]

Harmonics and Normal Mode of Vibration. G. W. O. Howe. [*Radio Review*, 2, pp. 449-450, September, 1921.]

A Low Voltage Cathode Ray Oscillograph. J. B. Johnson. [*Physical Review*, 17, pp. 420-421, March, 1921.]

Distributed Capacity in Transformer and Induction Coils: The Discrepancy between Theory and Experiment. P. Joye and M. Besoson. [*Bulletin of the Schweizerische Elektrotechniker Verein*, 12, pp. 37-41, February, 1921.]

Constant High Resistances for Measurement and Loading. J. E. Lilienfeld and W. Hofmann. [*Elektrotechnische Zeitschrift*, 41, pp. 870-873, November 4th, 1920.]

The Transmission of Electric Waves around the Earth's Surface. H. M. Maconald. [*Proceedings of the Royal Society*, 98A, pp. 116-222, December 3rd, 1920; and pp. 409-411, March 3rd, 1921.]

On the Question of the Existence of Two Resonant States in Circuits containing Iron. F. Margand. [*Revue Générale de l'Électricité*, 9, pp. 635-637, May 7th, 1921.]

Alternating Current Measurements on Amplifying Valves. F. F. Martens. [*Zeitschrift für Physik*, 4, pp. 437-440, 1921.]

Polarisation Capacity and Polarisation Resistance as Dependent upon Frequency. E. Merritt. [*Physical Review*, 17, pp. 524-525, April, 1921.]

The Measurement of the Effective Height of Aerials: a Special Case. G. Pession. [*Radio Review*, 2, pp. 228-231, May, 1921.]

Capacity of Aerials. G. Pession. [*L'Elettrotecnica*, 8, pp. 10-13, January, 1921.]

On the Propagation of Electromagnetic Waves around the Earth. B. van der Pol. [*Philosophical Magazine*, 40, p. 163, July, 1920.]

On the Use of Vector Methods in the Derivation of the Formulae used in Inductance and Capacity Measurements. H. H. Poole. [*Philosophical Magazine*, 40, pp. 793-809, December, 1920.]

On Systems with Propagated Coupling. A. W. Porter and R. E. Gibbs. [*Philosophical Magazine*, 41, pp. 432-440, March, 1921.]

Q_m. **Operators and Hysteresis Harmonics.** A. Press. [*Electrician*, 86, pp. 72-73, January 14th, 1921.]

Antenna Form Factor. A. Press. [*Electrician*, 85, pp. 492-493, October 29th, 1920.]

Theory of Antenna Radiation. A. Press. [*Proceedings of the Institute of Radio Engineers*, 8, pp. 525-540, December, 1920.]

The Significance of Maxwell's Theory. A. Press. [*Electrician*, 85, pp. 177-178, August 13th, 1920.]

The Wavelength Relation for a Generalised Bessel's Antenna. A. Press. [*Proceedings of the Institute of Radio Engineers*, 8, pp. 441-447, October, 1920.]

The Damping in Two Inductively Coupled Oscillatory Circuits with Tight Coupling. W. Rogowski. [*Archiv für Elektrotechnik*, 9, pp. 427-438, March, 1921.]

Improvements in Cathode Ray Oscillographs. W. Rogowski. [*Archiv für Elektrotechnik*, 9, pp. 115-120, July 8th, 1920.]

Some Electrical Guides for Wavemeter Design. O. C. Roos. [*Wireless Age*, 7, pp. 17-22, September, 1920.]

Universal, Honeycomb and Lattice Coils in General. O. C. Roos. [*Wireless Age*, 7, pp. 22-24, July; pp. 23-26, August; pp. 12-19, October; pp. 14-16, November; pp. 16-17, December, 1920.]

A Use for the Valve in Wireless Measurements. H. J. Round. [*Radio Review*, 2, pp. 303-307, June, 1921.]

The Capacity Coefficients of Spherical Conductors. A. Russell. [*Proceedings of the Royal Society*, 97A, pp. 160-172, April 15th, 1920.]

The Limit of Sensitiveness of the String Galvanometer. J. K. A. W. Salomonson. [*Proceedings of the Koninklijke Akademie van Wetenschappen, of Amsterdam*, 23, pp. 613-615, No. 4, 1921.]

On the Propagation of Undamped Electric Oscillations in Water and on the Dielectric Constant of Water. M. Sauzin. [*Comptes Rendus*, 171, pp. 164-167, June 19th, 1920.]

Electromagnetic Waves on Dielectric Wires. O. Schrieven. [*Annalen der Physik*, 63, pp. 645-673, December 1st, 1920.]

Two Laboratory Functions of the Triode Valve. J. Scott-Taggart. [*Electrician*, 86, p. 124, January 28th, 1921.]

On the Discontinuous Resonance Curves of Triode Oscillators. W. Seitz. [*Jahrbuch Zeitschrift für drahtlose Telegraphie*, 15, pp. 460-469, June, 1920.]

The Functions of the Earth in the Transmission of Electricity. C. E. Snell. [*Electrical Review*, 87, pp. 421-423, October 1st, 1920.]

The Transmission of Waves in Radiotelegraphy. A Sommerfeld. [*Annalen der Physik*, 62, pp. 95-96, May 20th, 1920.] Also H. Weyl. [*Loc. cit.*, 62, pp. 482-484, July 8th, 1920.]

Electrical Measurements at Ultra-Radio Frequencies. G. C. Southworth. [*Radio Review*, 2, pp. 25-31, January, 1921.]

On Some Optical Effects including Refraction and Rotation of the Plane of Polarisation due to the Scattering of Light by Electrons. J. J. Thomson. [*Philosophical Magazine*, 40, pp. 713-734, December, 1920.]

The Use of a Valve Oscillator for the Measurement of Inductance and Capacity at the General Post Office, London. A. Tobler. [*Journal Télégraphique*, 44, pp. 117-123, August 25th, 1920.]

Electric Oscillations along Straight Wires and Solenoids. J. S. Townsend. [*Journal of the Institution of Electrical Engineers*, 59, pp. 771-779, July, 1921.]

The Electron Tube as a Measuring Instrument. Trautwein. [*Telegraphen- und Fernsprech-Technik*, 9, pp. 101-104, September; pp. 119-123, October, 1920.]

Optimum Wavelength and Atmospherics. L. B. Turner. [*Radio Review*, 2, pp. 524-534, October, 1921.]

Measurements of Radiation of Radiotelegraphic Aerials. G. Vallauri. [*Radio Review*, 2, pp. 77-85, February; pp. 138-143, March; pp. 179-187, April, 1921.]

The Penetration of an Electromagnetic Wave into a Coil having Self-Capacity. K. W. Wagner. [*Jahrbuch Zeitschrift für drahtlose Telegraphie*, 15, p. 484, June, 1920.]

The Ultra-Micrometer: An Application of the Thermionic Valve to the Measurement of very small Distances. R. Whiddington. [*Philosophical Magazine*, 40, pp. 634-639, November, 1920.]

Capacitive Coupling in Radio Circuits. L. E. Whitmore. [*Physical Review*, 15, pp. 559-562, June, 1920.]

Physical Features and Wireless Transmission. J. Williamson. [*Wireless World*, 8, pp. 389-395, August 21st, 1920.]

Oscillating Circuits with Triode Generators as Acoustic Frequency Standards. [*Zeitschrift für Instrumentenkunde*, 40, pp. 119-120, June, 1920.]

TRANSMITTING APPARATUS.

On the Function of the Variable Anode Tap Connection in Triode Generators. E. V. Appleton. [*Radio Review* 2, pp. 419-424, August, 1921.]

A Comparison of High Frequency Alternators, Arcs and Valve Transmitters. G. von Arco. [*Telefunken Zeitung*, 4, pp. 5-8, March, 1921.]

Description of a Uni-Wave Signalling System for Arc Transmitters. W. A. Eaton. [*Electric Journal*, 18, pp. 114-115, April, 1921.]

Duplex Operation by Two Arcs. L. F. Fuller. [*Wireless Age*, 8, p. 20, January, 1921.]

Triode Oscillation Generators with Coupled Oscillatory Circuits. F. Harms. [*Radio Review*, 2, pp. 313-322, June, 1921.]

Heising's Modulator Method. R. A. Heising. [*Wireless Age*, 8, pp. 20-21, November, 1920.]

Researches on Frequency Transformers. T. Kujirai. [*Journal of the College of Engineering, Tokyo*, 10, pp. 37-143, March 30th, 1920.]

The Production of High-Frequency Currents by Dynamo-Electric Machinery. M. Latour. [*Annales des Postes, Télégraphes et Téléphones*, 10, pp. 32-59, March, 1921.]

On a Static Frequency Multiplier. P. Mauv and V. Bontron. [*Revue Générale de l'Électricité*, 9, pp. 523-527, April 16th, 1921.]

The Use of the Impulsion Wave Method—Frequency Doublers. T. Minnohara. [*Revue Générale de l'Électricité*, 8, pp. 859-862, December 18th, 1920.]

Some Improvements in the Poulsen Arc. P. O. Pedersen. [*Electrician*, 86, pp. 684-686, June 3rd; pp. 714-716, June 10th, 1921.]

On the Poulsen Arc in Coupled Circuits. P. O. Pedersen. [*Proceedings of the Institute of Radio Engineers*, 9, pp. 228-242, June, 1921.]

Some Improvements in the Poulsen Arc. P. O. Pederson. [*Proceedings of the Institute of Radio Engineers*, 9, pp. 434-441, October, 1921.]

On Radio Stations with Synchronous Rotary Spark Gaps. F. Perrin. [*Radio-électricité*, 1, pp. 503-506, March, 1921.]

Static Frequency Doublers. J. F. Peters. [*Electric Journal*, 28, pp. 122-123, April, 1921.]

Calorimetric Determination of Efficiency of Triode Generators. G. Preuner and L. Pungs. [*Jahrbuch Zeitschrift für drahtlose Telegraphie*, 15, pp. 469-479, June, 1920.]

The Load on the Modulation Tube in Radio Telephony Sets. E. S. Purington. [*Physical Review*, 15, pp. 556-557, June, 1920.]

High Voltage D.C. Machines for Supplying Spark Stations. W. Rogowski. [*Archiv für Elektrotechnik*, 9, pp. 191-226, September, 1920.]

The Status of the Static Frequency Doubler in Radio Engineering Practice. F. C. Ryan. [*Proceedings of the Institute of Radio Engineers*, 8, pp. 509-524, December, 1920.]

Advantages and Disadvantages of Various Systems of Transforming High Tension Alternating Current. F. Serrant. [*Houille Blanche*, 19, pp. 101-106, May and June, 1920.]

The Efficiency of Various Transmitting Valve Connections. W. Seitz. [*Jahrbuch Zeitschrift für drahtlose Telegraphie*, 15, pp. 457-460, June, 1920.]

The Use of a Spacing Wave in Continuous Wave Wireless Telegraphy. E. H. Shaughnessy. [*Post Office Electrical Engineers' Journal*, 14, pp. 30-32, April, 1921.]

The Poulsen Arc. E. W. Stone. [*Proceedings of the U.S. Naval Institute*, 46, pp. 1049-1073, July, 1920.]

The Breakdown and Protection of High Voltage D.C. Machines Supplying Spark Transmitters. K. W. Wagner. [*Elektrotechnische Zeitschrift* 41, pp. 581-584, July 29th; pp. 605-606, August 5th, 1920; also *Radio Review*, 2, pp. 22-25, January, 1921.]

A Contribution to the Theory of Magnetic Frequency Changers. J. Zenneck. [*Proceedings of the Institute of Radio Engineers*, 8, pp. 468-491, December, 1920.]

RADIOTELEPHONY.

Wireless Telephony with the Poulsen Generator. Lorenz Company. [*Jahrbuch Zeitschrift für drahtlose Telegraphie*, 17, pp. 373-375, May, 1921.]

Radio Telephone Circuits and Modulation. W. A. Macdonald. [*Radio Review*, 2, pp. 409-419, August, 1921.]

Radiotelephony with Triode Transmitters. W. Schaffer. [*Tijdschrift van het Nederlandsch Radiogenootschap*, 1, pp. 35-67, March, 1921.]

The Vacuum Tube in Radiotelephony. J. Scott-Taggart. [*Electrician*, 85, pp. 301-303, September 10th, 1920.]

An American Duplex Radiotelephone Set. M. B. Sleeper. [*Radio Review*, 2, pp. 751-753, December, 1920.]

Wireless Telephony. H. Zickendraht. [*Jahrbuch Zeitschrift für drahtlose Telegraphie*, 17, pp. 369-372, May, 1921.]

RECEIVING APPARATUS.

Abstractive and Selective Properties of Radio Antennae Circuits. E. Bennett. [*Journal of the American Institute of Electrical Engineers*, 39, pp. 995-1,004, November; pp. 1,052-1,062, December, 1920.]

A New Method for the Reception of Radio Signals, Eliminating Static and Interference. I. Cohen and J. O. Mauborgne. [*Journal of the Franklin Institute*, 191, pp. 423-424, March, 1921.]

Carborundum and its Rectification Effect. H. M. Dowsett. [*Radio Review*, 2, pp. 582-594, November; pp. 642-659, December, 1921.]

Rectification by Galena. C. Florisson. [*Comptes Rendus*, 171, pp. 106-108, July 12th, 1920.]

On a Method of Reducing the Effects of Atmospherics. W. Gerlach. [*Jahrbuch Zeitschrift für drahtlose Telegraphie*, 16, pp. 337-344, November, 1920.]

The Use of Coils Instead of Antennae as Wireless Receivers. H. Hoffmann. [*Jahrbuch Zeitschrift für drahtlose Telegraphie*, 16, pp. 31-66, July, 1920.]

The Heterodyne Method of Wireless Reception, its Advantages and its Future. M. Latour. [*Radio Review*, 2, pp. 15-21, January, 1921.]

Contact E.M.F. and Rectification. H. Rohmann. [*Physikalische Zeitschrift*, 21, pp. 699-703, December 1st, 1920.]

A New Wireless Call Arrangement. E. H. Shaughnessy. [*Electrical Review*, 87, pp. 68-69, July 16th, 1920.]

Wireless Telegraphic Printing on the Creed Automatic System. A. A. Campbell Swinton. [*Wireless World*, 8, pp. 641-648, December, 1920.]

Reception of Wireless Waves on a Shielded Frame Aerial. A. A. Campbell Swinton. [*Radio Review*, 2, pp. 545-547, October, 1921.]

RADIO INSTALLATIONS (INCLUDING DIRECTION FINDING).

The Alexanderson High Frequency Machine and the High-power Station at New Brunswick. F. Linke. [*Zeitschrift des Vereines deutscher Ingenieure*, 65, pp. 467-469, July 30th, 1921.]

Commercial Progress in Aircraft Wireless. R. H. Barfield. [*Radio Review*, 2, pp. 4-14, January, 1921.]

The Errors of Direction Finders. E. Bellini. [*Electrician*, 86, pp. 220-222, February 18th, 1921.].

Duplex Radiophone Receiver on U.S.S. "George Washington." H. H. Beverage. [*General Electric Review*, 23, pp. 807-812, October, 1920.]

The Proposed Radio Station at Sainte-Assize, near Melun. A. Bidault des Chaumes. [*Génie Civil*, 78, pp. 73-78, January 22nd, 1921.]

The Role of the Paris Radio Central. [*Radioélectricité*, 1, pp. 378-392, January, 1921.]

The Large French Radio Centre. [*Radioélectricté*, 1, pp. 393-403, January, 1921.]

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The Inauguration of the Paris Radio Central. [*Radioélectricité*, 1, pp. 369-377, January, 1921.]

The Paris Radio Central—June, 1921. [*Radioélectricité*, 2, pp. 14-24, July, 1921.]

Wireless and the Mercantile Marine. de Bouillane. [*Radioélectricité*, 1, pp. 280-284, November; pp. 325-335, December, 1920; pp. 443-447, February, 1921.]

The Most Powerful Station in the World. L. V. Bournat. [*Technique Moderne*, 13, pp. 49-54, February, 1921.]

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Electric Oscillations and Electric Waves. G. W. Pierce, Ph.D. [New York : *McGraw-Hill Book Co. Inc.* London : *McGraw-Hill Publishing Co., Ltd.* Pp. ix+517. Price 25s. net.]

Electricity at High Pressures and Frequencies. H. L. Transtrom. [Chicago: *The Joseph G. Branch Publishing Co.* Second edition. 1921. Pp. xi+247. Price $2.50.]

Elements of Radiotelegraphy. E. W. Stone. [New York: *D. Van Nostrand & Co.*, 25, Park Place. Pp. 265. Price $2.50.]

Engineering Mathematics. C. P. Steinmetz, A.M., Ph.D. [New York: *McGraw-Hill Book Co., Inc.* London: *McGraw-Hill Publishing Co., Ltd.* Third edition. Pp. 321. Price 17s. 6d. net.]

Examples in Alternating Currents. Professor F. E. Austin. [Hanover, N.H.: *Published by the Author.* Price $2.65.]

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***Experimental Wireless Stations.** P. E. Edelman. [New York: *Henley Publishing Co.*, 2, West 45th Street. Pp. 320. Price $3.00.]

Experiments with Alternate Currents of High Potential and High Frequency. Nikola Tesla. [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.*, 6/8, Bouverie Street, E.C.4. 1914. Pp. 174 ,with 42 illustrations. Price 5s.]

Formulae and Tables for the Calculation of Alternating Current Problems. Louis Cohen. [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.*, 6/8, Bouverie Street, E.C.4. Pp. 282. Price 17s. 6d.]

Generator and Motor Examples. Professor F. E. Austin. [Hanover, N.H.: *Published by the Author.* Price $2.75.]

How to Conduct a Radio Club. E. E. Bucher. [New York: *Wireless Press Inc.*, 326, Broadway. 1919. Pp. 148. Price 75 cents.]

How to Make Low-Pressure Transformers. Professor F. E. Austin. [Hanover, N.H.: *Published by the Author.* Price 90 cents.]

How to Pass U.S. Government Wireless License Examinations. E. E. Bucher. [New York: *Wireless Press Inc.*, 326, Broadway. Price 75 cents.]

Induction Coils in Theory and Practice. Professor F. E. Austin. [Hanover, N.H.: *Published by the Author.* Price $1.25.]

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***Maxwell's Theory and Wireless Telegraphy.** H. Poincaré and F. K. Vreeland. [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.*, 6/8, Bouverie Street, E.C.4. Price 10s. 6d.]

Methods of Measuring Electrical Resistance. E. F. Northrup, Ph.D. [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.*, 6/8, Bouverie Street, E.C.4. Pp. 390. Price 22s. 6d.]

Military Signal Corps Manual. Major J. A. White. [New York: *Wireless Press Inc.*, 326, Broadway. Price $2.25.]

Operators' Wireless Telegraph Handbook: Treatise on Construction and Operation of Wireless Telegraph and Telephone. V. H. Laughter. [Chicago: *F. J. Drake and Co.* Pp. 180. Price $1.25.]

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Prepared Radio Measurements with Self Computing Charts. Ralph R. Batcher, E.E. [New York: *Wireless Press, Inc.* London: *The Wireless Press, Ltd.* 1921. Pp. 132. Price 10s. 6d. net.]

Principles of Radio Communication. J. H. Morecroft. Assisted by A. Pirito and W. A. Curry. [New York: *John Wiley & Sons, Inc.* Pp. xx+935. Price 45s. net.]

Principles of Radiotelegraphy. C. M. Jansky. [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.*, 6/8, Bouverie Street, E.C.4. Pp. 242, with 179 illustrations. Price 12s. 6d.]

***Principles Underlying Radio-Communication.** Signal Corps, U.S.A. [Washington: *Government Printing Office*, 1919. Pp. 355. Price 55 cents. *New edition in Preparation.*]

Radio Communication. John Mills. [New York: *McGraw-Hill Book Co. Inc.* London: *McGraw-Hill Publishing Co., Ltd.*, 6/8, Bouverie Street, E.C.4. 1918. Pp. 210. Price 10s. net.]

Radio Engineering Principles. H. Lauer, B.S., and H. L. Brown, B.E.E. [New York: *McGraw-Hill Book Co., Inc.* London: *McGraw-Hill Publishing Co., Ltd.* Pp. xv+300 with 250 illustrations and 8 plates. Price 17s. 6d. net.]

Radio Instruments and Measurements. [New York: *Wireless Press Inc.*, 326, Broadway. Pp. 320. Price $1.75.]

Radio-telephony. Dr. A. N. Goldsmith, B.Sc., Ph.D. [New York: *Wireless Press Inc.*, 326, Broadway. Pp. 256. Price $2.50.]

Radio Questions and Answers. A. R. Nilson. [New York: *McGraw-Hill Book Co., Inc.* London: *McGraw-Hill Publishing Co., Ltd.* 1922. Pp. 92. Price 5s. net.]

Report of the Chief Signal Officer of the U.S. Army to the Secretary of War, U.S.A., 1920. [Washington: *Government Printing Office.* 1920. Pp.64.]

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Telegraph Engineering. E. Hausmann. [New York: *D. Van Nostrand Co.*, 25, Park Place. Price $3.00.]

The Book of Wireless. A. F. Collins. [New York: *D. Appleton & Co.*, 29/35, West 32nd. Street. Pp. 222. Price $1.50.]

Theory and Calculation of Transient Electric Phenomena and Oscillations. C. P. Steinmetz, A.M., Ph.D. [New York: *McGraw-Hill Book Co., Inc.* London: *McGraw-Hill Publishing Co., Ltd.* Third edition. 1920. Pp. 696, with 113 illustrations. Price 30s. net.]

The Consolidated Radio Call Book. [New York: *The Consolidated Radio Call Book Co. Inc.* Second edition. 1920. Pp. 160. Price $1.25.]

The How and Why of Radio Apparatus. H. W. Secor. [New York: *Experimenter Publishing Co. Inc.* Pp. 160. Price $1.75.]

The Thermionic Vacuum Tube and its Applications. H. J. van der Bijl. [New York: *McGraw-Hill Book Co., Inc.* London: *McGraw-Hill Publishing Co., Ltd.* 1921. Pp. 391, with 232 illustrations. Price 25s. net.]

Vacuum Tubes in Wireless Communication. E. E. Bucher. [New York: *Wireless Press Inc.*, 326, Broadway. Pp. 202. Price $2.25.]

Wireless Experimenter's Manual. E. E. Bucher. [New York: *Wireless Press Inc.*, 326, Broadway. 1920. Pp. 335. Price $2.25.]

Wireless Telegraph Construction for Amateurs. A. P. Morgan. [New York: *D. Van Nostrand Co.*, 25, Park Place. Pp. 236. Price $1.50.]

Wireless Telegraphy: Its History, Theory and Practice. A. F. Collins. [New York: *McGraw-Hill Book Co., Inc.* London: *McGraw-Hill Publishing Co., Ltd.* Pp. 300 with 332 illustrations. Price 15s. net.]

Wireless Telegraphy. J. Zenneck. Translated by A. E. Selig, M.Am.I.E.E. [New York: *McGraw-Hill Book Co., Inc.* London: *McGraw-Hill Publishing Co., Ltd.* Pp. 428, with 461 illustrations. Price 25s. net.]

***Wireless Telegraphy and Telephony.** C. I. Hoppough. [New York: *Henley Publishing Co.*, 132, Nassau Street. Pp. 236. Price $1.50.]

Wireless Telegraphy and Telephony (Simply Explained). A. P. Morgan. [New York: *Henley Publishing Co.*, 2, West 45th Street. Pp. 154. Price $1.50.]

Wireless Telegraphy and Wireless Telephony. A. E. Kennelly. [New York: *D. Van Nostrand Co.*, 25, Park Place. Price $1.25.]

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ARGENTINA.

Revista Telegrafica. [Buenos Aires.] $0.40 m.n. monthly.

AUSTRALIA.

Sea, Land and Air. [Sydney: *The Wireless Press*, 99, Clarence Street.] 1s. 3d. monthly. 15s. per annum.

BELGIUM.

Bulletin de la Société Belge des Électriciens. [Bruxelles: *Librairie Ramlot Frères et Sœur*, Rue Gretry 25.] Bi-Monthly. Price 4 fr.

L'Électricité pour Tous. [Laeken: *Henri Marchand*, 225, Boulevard Emile Bockstael.] 1 fr. Monthly. 10 fr. per annum. Outside Belgium 12 fr.

CANADA.

Canadian Wireless. [Montreal: 11, St. Sacrament Street, Montreal, P.Q.] Monthly. Price 10 cents.

The Journal of the Engineering Institute of Canada. [Montreal: *The Engineering Institute of Canada*, 176, Mansfield Street.] Monthly.

FRANCE.

Bulletin de la Société Française des Électriciens. [Paris: *Bureaux de la Revue Générale de l'Électricité*, 12, Place de Laborde.] Monthly. Price 8 fr.

Comptes Rendus hebdomadaires des Séances de l'Academie des Sciences. [Paris: *Gauthier-Villars et Cie.*, 55, Quai des Grands-Augustins.] Weekly. 94 fr. per annum.

Génie Civil. [*M. Ch. Talansier*, 6, Rue de la Chaussée-d'Antin. Weekly 2 fr. Annually 70 fr. Outside France 85 fr.]

L'Électricien. [Paris: *H. Dunod*, 47 and 49, Quai des Grands-Augustins.] 1.25 fr., fortnightly; 23 fr. per annum France; 30 fr. per annum outside France.

L'Électricité. [Paris: *Gauthier-Villars et Cie.*, 55, Quai des Grands-Augustins.] 1.50 fr. fortnightly; 25 fr. per annum France; 30 fr. per annum outside France.

La Nature. [Paris: *Masson et Cie*, 120, Boulevard Saint-Germain.] 1 fr. weekly; 40 fr. per annum France; 50 fr. per annum outside France.

La Technique Moderne. [Paris : *H. Dunod*, 49, Quai des Grands-Augustins.] Monthly, 5 fr. 50 fr. per annum. Outside France 60 fr. per annum.

***L'Onde Hertzienne.** Bulletin Mensuel de la Société Française d'Etude de Télégraphie et de Téléphonie sans Fil. [Paris : *La Société Française d'Etude de Télégraphie et de Téléphonie sans Fil.*] Now amalgamated with *La T.S.F. Moderne.*

La T.S.F. Moderne. [Paris, VIIe : *La T.S.F. Moderne*, 11, Avenue de Saxe.] Monthly. Price, 2.50 fr., France ; 3.50 fr., outside France. 24 fr. per annum France ; 36 fr. per annum outside France.

L'Électricité Industrielle et Commerciale. [Paris : *Gauthier-Villars et Cie.*, 55, Quai des Grands-Augustins.] Price, 1.50 fr., fortnightly ; 25 fr. per annum, France ; 30 fr. per annum, outside France.

Radioélectricité. [Paris, VIIIe : 12, Place de Laborde.] 3 fr. monthly ; 30 fr. per annum ; 36 fr., outside France.

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***"T.S.F." Revue Mensuelle de Radiotélégraphie.** [Valenciennes : Edited by *G. Flayelle*, 36, Rue de Mons.] *Publication suspended.*

GERMANY.

Annalen der Physik. [Leipzig : *J. A. Barth*, 16, Dorrienstrasse.] Fortnightly : 3 vols. yearly. Each volume (8 numbers), £1 1s. per vol.

Archiv für Post und Telegraphie. [Berlin: *Reichspostministerium.*]

Elektrotechnische Zeitschrift. [Berlin, W.9 : *J. Springer*, 23, Linkstrasse.] Weekly. Price M. 60 per annum.

Archiv für Elektrotechnik. [Berlin, W.9 : *Verlag Julius Springer*, 23, Linkstrasse.] Monthly. (12 parts per volume). Price M. 80 per vol.

Jahrbuch Zeitschrift für drahtlose Telegraphie und Telephonie sovie des Gesamtgebietes der Hochfrequenztechnik.. Edited by Prof. Dr. H. Fassbender. [Berlin, W.10 : *M. Krayn*, 39, Genthiner Strasse.] Monthly. Price M. 80 per annum.

Physikalische Zeitschrift. [Leipzig : *S. Hirzel*, 2, Königstrasse.] Price M. 96 per annum, Germany ; £1 16s. per annum, outside Germany.

Telegraphen- und Fernsprech-Technik. [Berlin, W.66 : *Richard Dietz.*] Monthly. Price M. 10 per annum.

Telefunken Zeitung. [Berlin, S.W.10 : *Gesellschaft für drahtlose Telegraphie*, 11, Hallesches Ufer 12/13.] Price variable.

Verhandlungen der Deutschen Physikalischen Gesselschaft. [Braunschweig : *Verlag Vieweg & Sohn.*] Monthly. Price M. 5 per annum.

Zeitschrift für Technische Physik. [Leipzig : *Verlag Johann Ambrosius Barth*, 16, Dorrienstrasse.] Monthly. Price M. 80 per annum ; £1 10s. per annum outside Germany.

Zeitschrift für Instrumentenkunde. [Berlin : *Verlag Julius Springer*, 23, Linkstrasse.] Monthly. Price M. 80 per annum.

Zeitschrift für Fernmeldetechnik Werk- und Gerätebau. [München, N.W.2. : *R. Oldenburg*, Glockstrasse 8.] Monthly. Price M. 9 per annum.

GREAT BRITAIN.

Electrical Industries. [London : *Electrical Press, Ltd.*, 13/16, Fisher Street, W.C.1.] Price 2d. weekly.

Electrical Review. [London : *The Electrical Review, Ltd.*, 4, Ludgate Hill, E.C.4.] Price 6d. weekly.

Electrical Times. [London : *The Electrical Times*, Sardinia House, Sardinia Street, W.C.2.] Price, 3d. weekly.

Electrician. [London: *Benn Bros., Ltd.*, 8, Bouverie Street, E.C.4.] Price 1s. weekly.

Electrics. [London: *The Electrical Press, Ltd.*, 13/16, Fisher Street, W.C.1.] Price 4d. monthly.

Engineering. [London: *Engineering*, 35/36, Bedford Street, W.C.2.] Price 1s. weekly.

Engineering Review. [London: *The Electrical Press, Ltd.*, 13/16, Fisher Street, W.C.1.] Price 9d. monthly.

Journal of the Institution of Electrical Engineers. [London: *E. and F. N Spon, Ltd.*, 57, Haymarket, S.W.1.] Price 10s. 6d. monthly.

Journal of the Royal Society of Arts. [London: *G. Bell & Sons, Ltd.*, York House, Portugal Street, W.C.2.] Price 1s. Weekly.

Journal of the Wireless Society of London. [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2.] Price 1s. 6d. monthly.

Nature. [London: *Macmillan & Co., Ltd.*, St. Martin's Street, W.C.2.] Price 1s. weekly.

Philosophical Magazine and Journal of Science. [London: *Taylor & Francis*, Red Lion Court, Fleet Street.] Price 5s. monthly.

Proceedings of the Cambridge Philosophical Society. [London: *Cambridge University Press*, Fetter Lane, London, E.C.4.] Price 8s. 6d. quarterly.

Proceedings of the Physical Society of London. [London: *Fleetway Press, Ltd.*, 3-9, Dane Street, High Holborn, London, W.C.1.] Price 6s. bi-monthly.

Proceedings of the Royal Society, Section A. [London: *Harrison & Sons, Ltd.*, 44-47, St. Martin's Lane, W.C.2.] Monthly. Price varies.

Post Office Electrical Engineers' Journal. [London: *The Electrical Review, Ltd.*, 4, Ludgate Hill, E.C.4.] Price 2s. quarterly.

Radio Review. [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2.] Price 5s. monthly; 60s. per annum.

Science Abstracts. [London: *Institution of Electrical Engineers*, Savoy Place, Victoria Embankment, W.C.2.] Price 2s. 6d. monthly.

***Technical Review.** [London: *The Technical Review, Ltd.*, 2, Central Buildings, Westminster, S.W.1.] *Publication suspended.*

Telegraph and Telephone Journal. [London: *Managing Editor*, G.P.O. North, E.C.1.] Price 4d. monthly.

Transactions of the Royal Society, Section A. [London: *Harrison & Sons, Ltd.*, 44-47, St. Martin's Lane, W.C.2.] Monthly. Price varies.

Wireless World. [London: *The Wireless Press, Ltd.*, 12/13, Henrietta Street, W.C.2.] Price 6d. fortnightly.

HOLLAND.

Physica: Nederlandsch Tijdschrift voor Natuurkunde. Edited by Drs. A. D. Fokker, E. Oosterhuis, and B. van der Pol. [Eindhoven: *Administratie van Physica*, Postbus 18.] Monthly. Fl. 7.50 per annum.

Proceedings Kloninklijke Akademie van Wetenschappen te Amsterdam. [Amsterdam: *Koninglijke van Wetenschappen.*]

Radio-Nieuws. The organ of the Nederlandsche Vereeniging voor Radiotelegrafie. [The Hague: *N. Veenstra*, Laan van Meerdevoort 30.] Published monthly. fl. 7.50 per annum for the Netherlands; fl. 8.50 per annum, outside the Netherlands.

Tijdschrift van het Nederlandsch Radiogenootschap. [Baarn: *Nederlandsch Radiogenootschap*, Oude Utrechtscheweg 8.]

Tijdschrift voor Electrotechniek. [The Hague: *N. Veenstra*, Laan van Meerdevoort 30.] Published monthly. fl. 8 per annum, Netherlands, fl. 10 per annum, outside Netherlands.

ICELAND.

Elektron. [Reykjavik: *Published by Society of Icelandic Telegraphists.*]

ITALY.

Bolletino Radiotelegrafico. [Leghorn: *Istituto Elettrotecnico e Radiotelegrafico della R. Marina.*]

L'Elettrotecnica. [Milan: *L'Elettrotecnica,* Via San Paolo, 10.] L. 2.50, three issues monthly; L. 50 per annum, Italy; Fr. (gold) 60 per annum, outside Italy.

L'Audion: Organo del Radio Club d'Italia. Edited by On. V. Bianchi. [Firenze: *Rog. E. Pochini,* Via del Giglio, 6.] Twice monthly, L.40 per annum.

Le Vie del Mare e dell Aria. [Italy: *Agenzia Radiotelegrafica.*] 2.50 fr. monthly; 20 fr. per annum.

JAPAN.

Proceedings of the Physico-Mathematical Society of Japan. [Tokyo: *Z. P. Maruya & Co., Ltd.,* Nihonbasi]. Monthly. Price yen 0.50.

NEW ZEALAND.

The Katipo. Official organ of the N.Z.P. and T. Officers' Association. Published monthly at Wellington.

RUSSIA.

Journal de Telegraphie et Telephonie sans Fil. (Published in Russian.) [Nijnij Nowgorod: *State Radio Laboratory.*] Irregular.

SPAIN.

***Aire Mar y Tierra.** [Madrid: *Prevsa Radiotelegrafica* (S.A.) Alcala 43.] 1s. monthly.

SWITZERLAND.

Journal Télégraphique. [Berne: *Bureau International de l'Union Télégraphique.*] 0.6 fr. monthly; 5.40 fr. per annum; 6.00 fr. per annum, outside Switzerland.

UNITED STATES OF AMERICA.

Electrical Review (Chicago). [Chicago: 542/53, Manadnock Block.] Published weekly. $3 per annum ($6 Europe).

Electrical World. [New York: Tenth Avenue, at 36th Street.] Weekly, 15 cents.

***Everday Engineering Magazine.** [New York: *Everyday Mechanics, Inc.,* 2, West 45th Street.] *Publication suspended.*

General Electric Review. [Schenectady, New York: *The General Electric Co.*] Published monthly. $2 per annum.

Journal of the American Institute of Electrical Engineers. [New York: *Published by the Institute,* 33, West 39th Street.] Published monthly. $12 per annum.

Journal of the Franklin Institute. [Philadelphia: *Franklin Institute of the State of Pennsylvania.*] 50 cents monthly; $5 per annum.

Journal of the Washington Academy of Sciences. [Washington: *R. L. Farie,* Treasurer, Coast and Geodetic Survey.] Twice monthly except July, August and September, when monthly, $6 per annum.

Popular Science Monthly. [New York: 225, West 39th Street.] $3 per annum.

Proceedings of the Institute of Radio Engineers. [New York: *The Institute of Radio Engineers*, College of the City of New York, 140th Street.] Bi-monthly. $9.60 per annum.

Proceedings of the Radio Club of America. [Published by *The Radio Club of America.*] Irregular.

Q.S.T. [Hartford, Conn.: *The American Radio Relay League, Inc.*] 20 cent. monthly; $2.00 per annum; $2.50 per annum outside U.S.A.

Radio and Model Engineering. [New York City: *The General Apparatus Co., Inc.*, 570, West 184th Street.] 10 cents. monthly; $1.00 per annum.

Radio Telegrapher. [New York: *The National United Radio Telegrapher's Association*, 44, Broad Street.] Monthly 15 cents. $1.50 per annum.

Radioist. [Omaha: *International Society of Radioists*, Executive Headquarters.]

Radio News. [New York: *Experimenter Publishing Co.*, 233, Fulton Street.] Published monthly. $2 per annum; $2.50, outside U.S.A.

Science and Invention (formerly " Electrical Experimenter "). [New York: *Experimenter Publishing Co.*, 233, Fulton Street.] Published monthly. $3 per annum; $3.50 outside U.S.A.

Scientific American. [New York: 233, Broadway.] Monthly 35 cents; $4.00 per annum.

Telegraph and Telephone Age. [New York: 253, Broadway.] Published twice monthly. $2 per annum; foreign postage, $1 extra.

Wireless Age. [New York: *Wireless Press, Inc.*, 326, Broadway.] 25 cents monthly; $2.50 per annum; $3, outside U.S.A.

AMATEUR SECTION

(A) Amateur and Experimental Wireless

(B) Directory of Wireless Societies

(C) Call Signs of British Experimental Societies

(D) List of Wireless Colleges and Schools

AMATEUR AND EXPERIMENTAL WIRELESS

BY HUGH S. POCOCK (*late Captain, R.E.*).

THE wireless worker who falls under the general classification of amateur must be divided into two distinct classes. There is the amateur who takes up wireless merely for the reason that it affords him amusement and is in the nature of a pastime, and the serious worker, who, though not directly engaged in the commercial development of the art, is, nevertheless, devoting his energies to the study, from a scientific point of view, of this new subject, which has already accomplished so much, and for which so great a future is expected.

Unfortunately, the term amateur is sometimes used to express a state of inefficiency, or incomplete knowledge of a subject, and the distinction between the amateur and the professional has become too strongly marked.

In wireless we might describe the amateurs as those who, being not necessarily engaged in the commercial side of wireless, are yet enthusiastic workers and experimenters in the science.

During the past year there has undoubtedly been a very large increase in the number of active amateurs in this country, and this number is increasing daily. There are many contributary causes to this increase in the popularity of wireless. The subject is one which has a special fascination, and those who once become devotees of the subject seldom lose their enthusiasm. It is a subject which can be studied without any heavy financial outlay in the purchase of apparatus, and quite efficient experimental apparatus is within the reach of almost everyone. Probably the strongest appeal, when first taking up wireless, is made by the fact that telephonic communication is now so far developed that any amateur listening-in in the evenings can hear music and speech transmitted, even though perhaps he does not himself contribute to the transmissions.

Since the General Post Office resumed the granting of licenses for the conduct of experiments in wireless telegraphy and telephony (these licenses having, of course, been suspended during the war), amateur wireless clubs have grown up all over the country and the number of these clubs has increased particularly during the past year. At about the end of 1920, there were 58 clubs in existence, of which 24 were affiliated with the Wireless Society of London. At the end of 1921, the total number of clubs was approximately 85 and 60 of these were affiliated with the Wireless Society of London, that is to say, more than the total number of clubs in existence at the end of the preceding year.

The second annual conference of Wireless Societies of this country was convened by the Wireless Society of London on March 1st, 1921, and on this occasion practically all the societies affiliated with the Wireless Society of London sent delegates to represent their particular societies. Commander Loring was present at the conference in the capacity of a Vice-President of the Wireless Society of London, but as a prominent official of the Post Office he was able to explain the position of the Post Office with regard to the licensing of amateur wireless, particularly in respect of transmitting permits, and the absolute necessity for some efficient control was made clear, although sympathy was expressed with those who, perhaps by reason of the unfavourable location of their stations, sought for licenses to use larger aerials or greater power in transmitting. It was shown that in exceptional cases the authorities had been prevailed upon to give special facilities to *bona fide* experimenters, whose qualifications ensured that they would not,

through ignorance or lack of experience, interfere with the conduct of wireless in commercial work and in the Services.

A remarkable feature of the progress of amateur wireless in this country is the very high grade of most of the papers read before societies, and the fact that the majority of the members are able to take an intelligent interest in discussions of theoretical points of a far from elementary nature. Perhaps this high standard may be partly attributed to the numerous and efficient text-books on wireless which are now available to students, and which are so graded that it is possible to find a publication applicable to a student of wireless in almost any stage of advancement in the subject.

The *Wireless World*, as the official organ of the Wireless Society of London and affiliated societies, continues to publish, in full, the papers read before the London Society and proceedings of their meetings. A section of the magazine is devoted to the publication of the proceedings of all other wireless societies in this country, and a certain number of papers read before other societies are published in full.

The year 1921 marks a great step in the advancement of amateur wireless. Early in the year arrangements were made between the amateurs of the United States and the amateurs of this country for the transmission of short wave wireless signals across the Atlantic in an attempt to communicate without going outside the scope allowed by the licenses permitted by the respective Governments. The amateurs in the United States are allowed to use a power for transmitting varying up to a maximum of 1 kW., whereas in this country 10 watts is set as the usual limit by the authorities. For this reason, it was decided that the Americans should transmit, and the British amateurs endeavour to receive the signals sent. The transmissions took place in the early morning of February 2nd, 4th and 6th. A large number of amateurs on this side entered for the competition and a number of valuable prizes to be awarded to successful competitors were placed at the disposal of the judges by various firms dealing in wireless apparatus. The results of the test was, however, disappointing. Although signals were almost undoubtedly heard by one or two competitors on this side, nothing was readable, and the judges expressed the opinion that not one entrant had received a single word or signal which could *unquestionably* be attributed to an American station.

It was not permitted, however, that this lack of success should act as a deterrent from further effort. The American Radio Relay League, which is an important organisation of the amateurs in America, expressed a keen desire to try again at a later date, and another test was organised for December of the same year, Mr. Philip R. Coursey again acting in the capacity of organiser on this side of the Atlantic. So great was the enthusiasm shown by the amateurs of America that they voted a sum of money, through their League, to send over to this country one of their most prominent amateurs, Mr. Paul F. Godley, in order that he might himself endeavour to read the signals from this side with his own apparatus.

A large number of British amateurs entered for this second competition and considerable enthusiasm was shown in the tests, although the general opinion appeared to be that there was not much hope of more success than had attended the first attempt.

Contrary to expectations, however, a large amount of success has attended these efforts. From all parts of the country reports were received of varying degrees of success in the reception of the signals, and this success was confirmed by a comparison of the secret transmission schedule with the signals reported to have been received. In all, eight British amateurs received signals from the other side. The representative from America, perhaps by reason of the fact that the Authorities did not restrict him in the matter of aerials and location, was the most successful. In some cases it was possible to copy complete messages transmitted from the other side.

This achievement of amateur wireless has created widespread interest amongst wireless engineers and experts in all parts of the world. By this

attainment the amateur has, more than ever, justified his existence, and it is likely that the authorities who control the activities of the amateur in various countries will give greater consideration than hitherto to this section of the wireless community, and that the amateur himself may reap benefit in being given increased facilities for the conduct of his experiments.

The fact must not be overlooked that a very considerable amount of valuable research work has already been done by the amateurs, whilst the younger enthusiasts in particular are building up for themselves such a foundation of experience in radio work and general electrical knowledge as would take them a very long while to acquire through the ordinary channels of a scientific training.

The authorities in the United States were not slow to recognise the value of this training, which gave no expense to the Government and was available immediately when wireless men were required in the war. The British pre-war amateurs, too, found their experiences extremely valuable, since they were ready trained for the work which they were called upon to do in their military careers.

There are at present in the United States approximately 200,000 amateur wireless stations, 25,000 of which are transmitting stations as well as receiving stations. In the United Kingdom there are probably not less than 6,000 receiving stations, some 250 of which are licensed for transmitting as well. In other countries, such as France, Belgium and Holland, the amateurs are a strong body, organised into numerous societies, though, unfortunately, the authorities of some countries are not all able to see their way to giving the amateurs facilities for practical work. France, hitherto very severe in her attitude towards the licensing of amateur stations, has at last been prevailed upon to grant transmitting licenses in special cases, but it appears that it will be some time before the wireless workers of that country are able to enjoy anything like the freedom which exists in the United States, or even in this country.

Apart from the fact that the United States amateurs are given the facilities for using considerably greater power in transmission than is permitted to the amateurs of this country, there is yet another very marked difference between their licenses and those operating here. In the United States, the amateurs are not in any way restricted in the matter of the destination of their transmissions or in the nature of the communications. In this country, the amateur is only permitted to communicate with other amateurs, limited to a maximum of five, who undertake to conduct experiments with him and whose names are endorsed on his license. Nothing which is in the nature of a communication or private message is permitted to be sent, the only transmissions allowed being those which relate actually to the experiments being conducted. The fact that the American amateur is permitted to transmit private messages to his friends in different parts of the country and to relay messages for other amateurs whose stations are not powerful enough to communicate direct with distant friends, is a very strong factor in the popularity of wireless in that country, and if it were possible to grant to British amateurs the same permission, there is no doubt that a very considerable impetus would be given to amateur and experimental wireless here.

Then, perhaps, the present year might see not only the successful reception in this country of amateur signals transmitted from the other side of the Atlantic, but actual exchange of communications with short wave low powered amateur stations might be accomplished.

But these things are in the hands of the authorities, to whom we must look for whatever slackening in the present restrictions it may be found possible to effect. However important we may regard the work of the amateur, we must not allow ourselves to overlook the fact that there are others besides ourselves who undoubtedly have a prior claim to the use of the æther.

DIRECTORY OF WIRELESS SOCIETIES

THE following list has been brought as up to date as circumstances would allow. Wireless Societies, however, are constantly being formed, and it is possible that particulars may have been received too late for insertion. Every endeavour has been made to present a thoroughly reliable list, but no responsibility can, however, be accepted for any possible inaccuracies.

AUSTRALIA.

Wireless Institute of Australia (New South Wales Division)—*Pres.*, E. T. Fisk; *Hon. Sec.*, Malcolm Perry, Box 2, King Street Post Office, Sidney, N.S.W. Tels., City 7349, Randwick 93.

Wireless Institute of Australia (South Australian Division)—Adelaide: *Pres.*, Hambly Clark; *Hon. Sec.*, C. E. Ames. Age limit 16 years. Annual sub., 10s. 6d., payable half-yearly. Official Organ, *Sea, Land and Air.*

Wireless Institute of Australia (Victorian Division)—*Pres.*, Major W. J. Sheldon; *Hon. Sec.*, Capt. Roach-Pierson, Melbourne, Victoria.

Wireless Institute of Australia (West Australian Division)—*Pres.*, W. E. Coxon; *Hon. Sec.*, G. W. Dean, 27, Holyrood Street, West Leederville, Perth.

BELGIUM.

Antwerp Section—*Sec.*, M. A. Wust, A.C.G.I., 128, Avenue du Margrave, Antwerp.

Cercle Belge d'études Radiotélégraphiques—*Sec.*, M. de Wouters, 16, Rue Plétinckx, Brussels. Official Organ, *La T.S.F. Moderne.*

Radio Club de Belgique. Official Organ, *L'Electricité pour Tous.* 20, Rue du Canal, Brussels.

CANADA.

*Amateur Radio Club of Vancouver—*Sec.*, L. H. McKay, 536, 8th Avenue, W., Vancouver, B.C.

*Montreal Radio Association—*Sec.*, L. E. Hunton, 209, Wilson Avenue, Montreal, Canada.

*Ottawa Amateur Radio Association—*Sec.*, A. R. Gladden, 405, Wellington Street, Ottawa, Ontario, Canada.

Radio Club of Winnipeg—Kelvin Technical High School. *Hon. Pres.*, J. M. F. Wilson, B.Sc.; *Pres.*, J. R. Foster; *Sec. and Treas.*, E. A. Strong, Winnipeg. Number of Scholars: 40.

Regina Amateur Radio Association—*Hon. Sec.*, H. Miller, 2226, Searle Street, Regina, Sask.

The Radio Research Club of Canada—*Sec. and Treas.*, C. A. Culver, Ph.D., Hydro Electric Laboratories, 8, Strachan Avenue, Toronto, Ontario, Canada.

*Southern Ontario Radio Association—*Sec.*, D. Aitchison, 450, Janette Avenue, Windsor, Ontario, Canada.

The Hub City Radio Club (Saskatoon, Canada)—*Sec.*, Wm. Astin, 1312 Avenue C. North, Saskatoon, Sask., Canada.

The Sunday Leader Radio Club—*Sec.*, C. H. Starr, Windsor, Nova Scotia, Canada.

*Wireless Association of Ontario—*Sec.*, Wm. F. Choat, 241, Robert Street, Toronto, Canada.

**Affiliated with the American Radio Relay League.*

DENMARK.

Radiotelegrafist foreningen af 1917 (Skandinavisk) Copenhagen—Car Johansgade, 14—*Sec. and Treas.*, R.Rasmussen. Formed September 8th, 1917.

FRANCE.

Société Havraise de T.S.F. (*Affiliated with S.F.E.T.S.F.*)—*Sec.*, M. J. Jacquin, 27, Rue de la Paix, Le Havre.

Société Nantaize de T.S.F. (*Affiliated with S.F.E.T.S.F.*)—*Sec.*, M. Fonterreau, 19, Rue Contrescarpe, Nantes.

Association des Anciens Radios de 8e Génie—*Hon. Pres.*, M. le Général Ferrié; *Pres.*, M. Alain-Charles Boursin; *Sec.*, M. J. Raynaud, 230, Fbg. St. Martin, Paris.

Radio-Association Liancourt—*Sec.*, M. Pierre Douvry, 4, Rue des Arts et Métiers, Liancourt (Oise).

Société Ardennaise de Radiotélégraphie—Monsieur M. Thirriot, 6, Bord des deux Villas, Charleville, (Ardennes).

Radio Club Belfortain—*Pres.*, Monsieur Ch. Wandres, 31, Rue de Mulhouse, Belfort.

Radio Club de Bordeaux—*Sec.*, Monsieur M. Meunier, 90, Rue Paul Camelle, Bordeaux.

Radio Club Bordelais—20, Cours Pasteur, Bordeaux.

Société de Radiotélégraphie et de Preparation Militaire (S.R P.M.)—*Pres.*, Monsieur J. E. Lavigne, 44, Rue Gay Lussac, Paris.

Société Française d'Etude de Télégraphie et de Téléphonie sans Fil (*S.F.E.T.S.F.*)—*Sec.*, Monsieur Roussel, 12, Rue Hoche, Juvisy (Seine et Oise). Official Organ, *La T.S.F. Moderne.*

Rouen Section—*Sec.*, Monsieur A. Restout, 8, Rue de la Haie, Boisguillaume (Pres. Rouen).

Société Provençale de T.S.F.—*Sec.*, Monsieur Seksik, 47, Rue Reinard, Marseilles. (*Affiliated with S.F.E.T.S.F.*)

Société Quimpéroise d'Electricité et de T.S.F.—*Sec.*, Monsieur Picquenard, 19, Rue de Brest, Quimper, Finisterre.

Société Française Radio Sport—*Pres.*, R. Bourgnignon, 152, Avenue de Wagram, Paris (XVIIe).

Club Radio des Patronages Parisiens (C.R.P.P.)—*Sec.*, Monsieur A. Bonniere, 301, Rue Lecourbe, Paris.

Radio Club du Nord de la France—*Sec.*, Monsieur Bernast, 55, Rue Nauve, Roubaix.

Radio Club de la Côte d'Azur (Nice).—*Pres.*, Monsieur Leon Deloy, 55, Bvd. Montboron, Nice; *Vice-Pres.*, Monsieur Alexandra Prezeau, 25, rue Pertinax, Nice; *Sec.*, Monsieur Louis Paulouin, 46, Ave, St. Lambert, Nice; *Tres.*, Monsieur Besneux, 101, Bvd. Gambetta, Nice.

GREAT BRITAIN.

The Wireless Society of London—*Pres.* Admiral of the Fleet Sir Henry B. Jackson, G.C.B., K.C.V.O., F.R.S., D.Sc., M.I.E.E. *Hon. Sec.*, L. McMichael, 32, Quex Road, W. Hampstead, London, N.W. 6, Tel., *Hampstead* 8777. Meetings, fourth Wednesday in month, 6 p.m., at Institution of Electrical Engineers, Victoria Embankment. Official Organ, *The Wireless World.*

Aldershot and District Wireless Society—*Hon. Sec.*, Queen's Avenue, Aldershot.

*Altringham Wireless Society—*Hon. Sec.*, Breeze Crest, Plane Tree Road, Hale, Cheshire.

Birmingham Experimental Wireless Club—*Hon. Sec.*, F. S. Adams, 110, Ivor Road, Sparkhill, Birmingham.

*Blackpool and Fylde Wireless Society—*Hon. Sec.*, C. Sheffield Doog, The Poplars, 6, Seventh Avenue, South Shore, Blackpool.

**Affiliated with the Wireless Society of London.*

Bolton Wireless Society—*Hon. Sec.*, O. Stott, Moss Bank House, Smithills, Bolton.

*Borough of Tynemouth Y.M.C.A. Amateur Wireless Society, Y.M.C.A. Buildings, Bedford Street, N. Shields.

Bournemouth and District Radio Club—*Hon. Sec.*, T. H. Dyke, 2, Iris Road, Winton.

Bradford-on-Avon Wireless Society—*Hon. Sec.*, H. Helps, 4, Ivy Terrace, Bradford-on-Avon, Wilts.

*Bradford Wireless Society—*Hon. Sec.*, John Bever, 85, Emm Lane, Bradford.

*Brighton Radio Society—*Hon. Sec.*, D. F. Underwood, 68, Southdown Avenue, Brighton.

*Bristol and District Wireless Association—*Hon. Sec.*, 5, Pembroke Vale, Clifton, Bristol.

*Bristol Wireless Association—*Hon. Sec.*, Portishead Rectory, Somerset.

*Burton-on-Trent Wireless Society—*Hon. Sec.*, 66, Edward Street, Burton-on-Trent.

Cambridge and District Wireless Society—*Hon. Sec.*, H. W. Taylor, Camden House, Park Terrace, Cambridge.

*Cambridge University Wireless Society—*Hon. Sec.*, D. Wade, Post Office, Trumpington Street, Cambridge.

*The Cardiff and South Wales Wireless Society—*Hon. Sec.*, 16, Adamsdown Square, Cardiff.

*City and Guilds Wireless Society—*Hon. Sec.*, City and Guilds Engineering College, Exhibition Road, London, S.W.7.

City of London School Wireless Society—*Hon. Sec.*, J. H. Gawler, City of London School, Victoria Embankment, E.C.4.

*The Corinium Wireless Society—*Hon. Sec.*, The Old Vicarage, Cirencester.

Coventry Wireless Association—J. E. Bolus, 14, Coundon Road, Coventry.

*Cowes and District Radio Society, Pretoria, Castle Street, East Cowes, I.O.W.

The Cricklewood and Brondesbury Radio Club—*Hon. Sec.*, C. N. Green, 213, Fordwych Road, Cricklewood, N.W.2.

*Croydon Wireless and Physical Society—*Hon. Sec.*, B. Clapp, Meadmoor, Brighton Road, Purley.

*Dartford and District Wireless Society—*Hon. Sec., and Treas.*, E. C. Deavin, 84, Hawley Road, Wilmington, Dartford.

*Derby Wireless Club—*Hon. Sec.*, 1, Littleover Hill, Derby.

Dundee and District Wireless Club—*Hon. Sec.*, A. MacLeod, 13, Magdalene Yard Road, Dundee.

*Edinburgh and District Radio Society—*Hon. Sec.*, W. Winkler, 9, Ettrick Road, Edinburgh.

Epsom and District Amateur Radio Society—*Hon. Sec.*, H. N. Penfold, 32, The Parade, Epsom.

*Folkestone and District Wireless Society—*Hon. Sec.*, A. S. Gothard, 8, Longford Terrace, Folkestone.

*Glasgow and District Radio Club—*Hon. Sec.*, 7, Queen's Gardens, Glasgow.

*Glevum (Gloucester) Radio and Scientific Society—*Hon. Sec.*, J. Mayall, "Burfield," St. Paul's Road, Gloucester.

*Gloucester Wireless and Scientific Society—*Hon. Sec.*, J. J. Pittman, 1, Jersey Road, Gloucester.

*Halifax Wireless Club—*Hon. Sec.*, Louis J. Wood, Y.M.C.A., Clare Hall, Halifax.

Hounslow and District Wireless Society—*Hon. Sec.*, A. J. Rolfe, 20, Standard Road, Hounslow.

Huddersfield Wireless Society (Y.M.C.A.)—*Hon. Sec.*, F. Simpson, 25Bk, Colne Street, Aspley, Huddersfield.

Ilford and District Radio Society—*Hon. Sec.*, L. Vizard, 12, Seymour Gardens, The Drive, Ilford.

**Affiliated with the Wireless Society of London.*

Ipswich and District Wireless Society—*Hon. Sec.*, F. T. G. Townsend, 46, Grove Land, Ipswich.

Kensington Wireless Society—*Hon. Sec.*, J. H. Reeves, 2, Penywern Road, Earl's Court, S.W.

King's College Wireless Society—*Hon. Sec.*, G. R. Gould, 4, Bedford Place, W.C.1.

Leeds and District Wireless Society—*Hon. Sec*, 37, Mexborough Ave., Leeds.

*Leicestershire Radio Society—*Hon. Sec.*, 269, Mere Road, Leicester.

*Lincoln and District Wireless Society—*Hon. Sec.*, 168, West Parade, Lincoln.

*Liverpool Wireless Association—*Hon. Sec.*, J. Coulton, 98, Ampthill Road, Liverpool.

The Lowestoft and District Wireless Society—*Hon. Sec.*, L. Burcham, "Gouzeacourt," Chesnut Avenue, Oulton Broad.

*Luton Wireless Society—*Hon. Sec.*, W. F. Neal, Hitchin Road Boy's School, Luton.

*Manchester Wireless Society—*Hon. Sec.*, 1, Parkwood, Victoria Park, Manchester.

The Margate and District Wireless Club—*Hon. Sec.*, J. Byers, 33, Richmond Avenue, Margate.

Newark-on-Trent and District Wireless Society—*Hon. Sec.*, G. T. Lindall, 6, Beech Avenue, Hautonville, Newark-on-Trent.

*Newcastle Wireless Association—*Hon. Sec.*, Colin Bain, 51, Grainger Street, Newcastle-on-Tyne.

*North London Wireless Association—*Hon. Sec.*, J. W. S. Prior, c/o Superintendent, Peabody Buildings, Essex Road, N.1.

*North Middlesex Wireless Club—*Hon. Sec.*, E. M. Savage, Nithsdale, Eversley Park Road, Winchmore Hill, N.21.

*N. S. Rly. Wireless Society—*Hon. Sec.*, P. E. Banks, 87, Spencer Road, Shelton, Stoke-on-Trent.

*Oldham Lyceum Wireless Club—*Hon. Sec.*, Oldham Lyceum, Oldham.

*Plymouth Wireless and Scientific Society—*Hon. Sec.*, G. H. Lock, 9, Ryder Road, Stoke, Devonport.

Portsmouth and District Wireless Association—*Hon. Sec.*, R. G. H. Cole, 34, Bedford Road, Southsea.

*Preston Scientific Society—*Hon. Sec.*, 119a, Fishergate, Preston.

*Radio Scientific Society of Manchester—*Hon. Sec.*, 16, Todd Street, Manchester.

The Rugby and District Wireless Club—*Hon. Sec.*, Arthur T. Cave, 3, Charlotte Street, Rugby.

St. Austell Wireless Club—*Hon. Sec.*, H. Whetter, 26, Fore Street, St. Austell.

*Sheffield and District Wireless Society—*Hon. Sec.*, L. H. Crowther, A.M.I.E.E., 156, Meadow Head, Norton Woodseats, Sheffield.

Smethwick Experimental Wireless Club—*Hon. Sec.*, R. H. Parker, Radio House, 31, Wilson Road, Smethwick, Birmingham.

South East Essex Wireless Club—*Hon. Sec.*, F. A. Mayer, Stilemans, Wickford, Essex.

Southend and District Wireless Club—D. W. Plaistow, 21, Oakleigh Park Drive, Leigh-on-Sea.

*Southport Wireless Society—*Hon. Sec.*, 26, Hartwood Road, Southport.

South Woodford Radio Society—*Hon. Sec.*, L. R. Gaywood, "Eastholme," 190, Hermon Hill, South Woodford, Essex.

Stoke-on-Trent Wireless and Experimental Society—*Hon. Sec.*, F. T. Jones, 360, Cobridge Road, Hanley.

*Stockport Wireless Society—*Hon. Sec.*, Mersey Chambers, King Street East, Stockport.

*Sunderland and District Amateur Radio Society—*Hon. Sec.*, H. Burnley, 15, Ridley Street, Southwick-on-Wear.

**Affiliated with the Wireless Society of London.*

*Sussex Wireless Research Society—E. Hughes, B.Sc., A.M.I.E.E., Technical College, Brighton.

Tunbridge Wells and District Wireless Society—*Hon. Sec. and Treas.*, W. H. Glaser, M.A., 4, Vale Avenue, Tunbridge Wells.

Walsall Amateur Radio Club—*Hon. Sec.*, E. W. Bridgewater, 17, White Street, Walsall.

*Wandsworth Wireless Society—*Hon. Sec.*, Technical Institute, High Street, Wandsworth.

Westcliff and District Wireless Club—*Hon. Sec.*, F. Harper-Shrove, Devond Lodge, Lydford Road, Westcliff-on-Sea.

*West London Wireless Association—*Hon. Sec.*, 19, Bushey Road, Harlington, Middlesex.

*Willesden Wireless Society—*Hon. Sec.*, F. A. Tuck, 87, Mayo Road, N.W.10.

The Wimbledon and District Wireless Society—*Hon. Sec.*, W. G. Marshall, 48, Warren Road, Merton, S.W.19.

*Wireless and Experimental Association—*Hon. Sec.*, G. Sutton, A.M.I.E.E., 18, Melford Road, S.E.22.

The Wireless Society of Dorsetshire—*Hon. Sec.*, I. Chapman, "Abbotsford," Serpentine Road, Poole.

*Wireless Society of Greenwich—*Hon. Sec.*, W. W. Burnham, 18, Blackheath Rise, S.E.

*The Wireless Society of Hull and District—*Hon. Sec.*, H. Nightscales, 16, Portobello Street, Hull.

Worcester and District Radio Association—*Hon. Sec.*, C. C. Hannay, 50, Waterworks Road, Worcester.

The Working Men's College Wireless Club—*Hon. Sec.*, W. F. Matt, c/o Working Men's College, Crowndale Road, N.W.1.

*Woolwich Radio Society—*Hon. Sec.*, 42, Greenvale Road, Eltham, Kent.

*York Wireless Club—*Hon. Sec.*, 16, Wentworth Road, York.

GREECE.

Union of Greek Wireless Telegraphists, Athens.

HOLLAND.

Nederlandsch Radio Genootschap—Utrecht, *Sec.*, Willem Barentzstraat, 8.

Nederlandsche Vereeniging voor Radiotelegrafie — Rotterdam, *Sec.*, Wijnhaven, 119.

Vereeniging van Radiotelegrafisten ter Koopvaardy—*Sec.*, J. Schuitemaker, Jerecholaar, 74, Rotterdam.

ICELAND.

Technical Society of Iceland—*Sec.*, Otto B. Arnar, Reykjavik.

LUXEMBOURG.

Radio Club de Luxembourg—*Pres.*, Dr. Eng. Rod. Wickering ; *Sec.*, M. J. Wolff, 67, Avenue Baumbusch, Luxembourg. Tel., Ville 1043. Official Organ, *T.S.F., Moderne.*

NEW ZEALAND.

New Zealand Amateur Wireless Association—Prof. Fari, Canterbury College, Christchurch, New Zealand.

New Zealand Amateur Wireless Club—*Sec.*, F. Kellegher, 83, Marine Parade, Napier.

New Zealand Wireless Institute—*Sec.*, J. O. Taylor. Minimum age 18. Annual sub.: Full members, one guinea ; students and country members, 10s. 6d. Official Organ, *Sea, Land and Air.*

Radio Society of Christchurch, N.Z.—*Sec.*, L. F. Ball, 114, Southampton Street, Christchurch, New Zealand.

**Affiliated with the Wireless Society of London.*

SOUTH AFRICA.

Cape Provincial Branch—*Hon. Sec.*, G. H. J. Sadler, P.O. Box 43, Simon's Town.

†Radio Society of South Africa—*Hon. Sec.*, G. L. R. Lowe, 51, Kitchener Avenue, Bezuidenhout Valley, Johannesburg.

SWITZERLAND.

Radio Club Gênevois—*Sec.*, M. J. Brocker, 63, Rue du 31 Décembre, Geneva.

UNITED STATES OF AMERICA.

*Amateur Radio Association of Delaware County—*Pres.*, Geo. D. Bowers, R.F.D. 2, Media, Pa Del. Co.

*Ann Arbor Radio Association—*Sec.*, Franklin D. Johnston, 1335, Hill Street, Ann Arbor, Mich.

*Anderson Radio Association—*Sec.*, Harold Longfellow, 1324, Nichol Avenue, Anderson, Ind.

*Armour Villa Radio Association—*Sec.*, Walter A. Remy, Desmond Avenue, Bronxville, N.Y.

*Atlanta Radio Club—*Pres.*, John C. Candler, 135, E. Lake Drive, Atlanta, Ga.

*Austin Radio Club—*Sec.*, C. P. Granberry, 711, W. 7th Street, Austin, Texas.

*Baltimore Radio Association—*Sec.*, H. J. Rathbun, 105, W. Franklin, Street, Baltimore, Md.

*Bath Radio Association—*Sec.*, M. L. White, 913, Washington Street, Bath, Maine.

*Battle Creek High School Radio Club—*Sec.*, Homer Davis, 46, Summer Street, Battle Creek, Mich.

Batavia Radio Club—*Sec.*, Ackley Wicks, Batavia Radio Club, Batavia, N.Y.

*Bay Counties Radio Club—*Sec.*, R. W. Carroll, 444-24th Street, Oakland, Calif.

*Blackstone Valley Radio Association—*Sec.*, J. W. Whitmore, 64, Meadow Street, Pawtucket, R.I.

*Bloomington High School Radio Club—*Sec.*, Arthur E. Tabraham, c/o Bloomington High Street, Bloomington, Ill.

*Boston Executive Radio Council—*Pres.*, Sumner B. Young, 294, Ashmount Street, Dorchester, Mass.

*Bridgeport Radio Club—*Sec.*, H. E. David, 796, Noble Avenue, Bridgeport, Conn.

*Brockton District Radio Club—*Sec.*, Raymond A. Linnell, 153, Prospect Street, Brockton, Mass.

*Brookline Radio Club—*Sec.*, Wm. Potter, 19, Braemore Road, Boston, Mass.

*Brooklyn Technical Radio Club—*Pres.*, N. B. Foote. 85, Livingston Street, Brooklyn, N.Y.

Canandaigua Radio Club, N.Y.—*Sec.*, Rudolph Miller, Canandaigua Academy, N.Y.

*Canton Radio Club—*Sec.*, C. P. Furney, 809, Lawrence Road, N.E. Canton, Ohio.

*Case Radio Club—*Sec. and Treas.*, L. F. Bather, 68, E. Warren Avenue, Detroit, Mich.

*Central Ill. Radio Club—*Sec. and Treas.*, C. R. White, Bloomington, Ill.

*Central Maine Radio Club—*Pres.*, Harold M. Claflin, 48, Silver Street, Waterville, Me.

†*Affiliated with the Wireless Society of London.*
**Affiliated with the American Radio Relay League.*

*Central Mich. Wireless Association—*Pres.*, Roy F. Sadler, 331, Washington Avenue, N. Lansing, Mich.

*Chicopee Radio Association—*Pres.*, M. J. Duffy, P.O. Box 111, Chicopee Falls, Mass.

*Colorado Springs High School Amateur Association—*Sec.*, Wheeler Gowdy, 1321 W. Kiowa Street, Colorado Springs, Colo.

*Community Radio Club—*Sec.*, T. P. Sipp, 107, Westmoreland Avenue, White Plains, N.Y.

*Collegeville Radio Club—*Sec.*, Fred W. Mergenthaler, Collegeville, Pa.

*Columbus Radio Club—*Sec.*, Eugene W. Riel, 201, W. 8th Avenue, Columbus, Ohio.

*Conn. Valley Radio Club—*Pres.* C. J. Faulstich, 40, E. Alvord Street, Springfield, Mass.

*Council Bluffs Y.M.C.A. Radio Club—*Sec.*, Alfred Beardsley, Council Bluffs, Iowa Cor., 7th and 1st Avenue.

*Crescent Radio Club—*Sec.*, Lee H. Maurer, 219, Clearfield Street, Clearfield, Pa.

*Dallas Radio Club—*Sec.*, Porter T. Bennett, 3600, Carl Street, Dallas, Texas.

D.A.R. Radio Club of Menominee, Mich—*Sec.*, Otto F. Jilek, 1210, Somerville Avenue, Menominee, Mich.

*Detroit Radio Association—*Vice-Pres.*, Michael D. Lyons, Jr., 463, Green Avenue, Detroit, Mich.

Downers Grove Radio Club—*Sec.*, Wm. J. O'Neill, 123, Summit Street, Downers Grove.

*Duluth Radio Association—*Pres.*, James Hayes, 220, W. 4th Street, Duluth, Minn.

*Eastern Ohio and Western Pa. Radio Amateurs' Association—*Sec.*, H. J. McConnell, 931, Beckford Street, Newcastle, Pa.

*Electric City Radio Club—*Sec.*, S. D. McFarland, 802, Woodlawn Street, Scranton, Pa.

*Elmhurst Radio Relay League—*Sec.*, Robert H. Winston, Elmhurst, Ill.

*Essex County Radio Association—*Pres.*, F. Clifford Estey, 22, Oakland Street, Salem, Mass.

*Eureka Radio Club—*Sec.*, Henry Klaus, Eureka, Ill.

*Fall River Amateur Radio Club—*Sec.*, Thos. M. Hopkinson, 328, Sprague Street, Fall River, Mass.

*Fordham Radio Club—*Sec.*, Wm. Weller, 2674, Bailey Avenue, New York, City.

*Fort Wayne Radio Association—*Sec.*, Ralph H. G. Meyer, 2137, Oakley Street, Fort Wayne, Ind.

*Fort Worth Radio Club—*Sec.*, Oba R. Garrett, 611½, Main Street, Ft. Worth, Texas.

*Framingham Radio Club—*Sec.* Vincent M. Sawyer, 7, Gilbert Street, Framingham, Mass.

*Galesburg Radio Association—*Sec. and Treas.*, Roswell Nowry, 1163, N. Broad Street, Galesburg, Ill.

*Galveston Radio Club—*Sec.*, L. E. Tisell, Box 71, Galveston, Texas.

*Granite City Radio Club—*Pres.*, Lee N. Hamm, 6314, Wied Avenue, Granite City, Ill.

*Greater Boston Spark Coil Club—*Pres.*, Frank W. O'Neill, 196, Hamilton Street, Dorchester, Mass.

Green Point Radio Club—*Sec.*, George W. Pope, 1038, Lorimer Street Brooklyn, N.Y., U.S.A.

*Haddonfield Radio League—*Pres.*, Edw. Braddock, 31, King's Highway, E. Haddonfield, N.J.

*Hampton Roads Radio Association—*Sec.*, R. L. Hopkins, 426, York Street, Norfolk, Va.

*Hill City Radio Club of the Summit Y.M.C.A.—*Sec.*, Dana Griffin, 3, Oak Ridge Avenue, Summit, N.J.

****Affiliated with the American Radio Relay League.***

*Houston Radio Club—*Sec.*, L. Peine, 1506, Rosalie Avenue, Houston, Texas.

*Indianapolis Radio Association—*Sec.*, C. A. Rich, 1520, Sturn Avenue, Indianapolis, Ind.

*Iowa Radio Relay League—*Pres.*, Paul A. Young, Radio Dept., Coe College, Cedar Rapids, Iowa.

Irvington N.J. Radio Club—The Club House, 55, Linden Avenue, Irvington, N.J.

*Jefferson City Radio Club—*Sec.*, Bethel Brace, 403, E. Ashley Street, Jefferson City, Mo.

*Kokomo Radio Association—*Sec.*, John McDowall, Kokomo, Ind.

*Laconia Radio Club—*Sec.*, George W. Mayo, Room 12, Smith Block, Laconia, N.H.

*La Crosse Radio Club—*Sec.*, H. F. Fruit, La Crosse High School, La Crosse, Wisc.

*Lake Superior Radio Association—*Sec.*, David S. Lloyd, Sault Ste. Marie, Ont., Can.

*Lane Radio Association—*Sec.*, Geo. Frost, 801, N. Dearborn Street, Chicago, Ill.

*Lehigh Valley Radio Association—*Pres.*, Arthur F. Breisch, 516, N. Center Street, Bethlehem, Pa.

*Lowell Radio Club—*Sec.*, W. H. Carney, Lowell, Mass.

*Manhattan Association of Radio Scouts—*Sec.*, Max Schwartz, 73, Madison Avenue, New York City:

*Manitowoc Radio Association—*Sec.*, Hugo Oestrack, 1521 Clark Street, Manitowoc, Wisc.

*Marietta Radio League—*Sec.*, E. W. Kiger, Williamstown, W. Va.

*Mystic Valley Radio Club—*Sec.*, Henry C. Dunton, 75, Josephine Avenue, Somerville, Mass.

*Maryland Radio Association—*Sec.*, S. P. Brady, Jr., Washington Apartments, Baltimore, Md.

*Mass. Inst. of Tech. Radio Society—*Sec.*, Fullerton D. Webster, M.I.T., Cambridge, Mass.

*Miami Radio Club—Raymond Martin, 527, Fifth Street, N.W. Miami, Fla.

*Middlesex Wireless Association—*Pres.*, Arthur E. Watkins, 12, Faskett Street, W. Somerville, Mass.

*Mil. Amateur's Radio Club—*Pres.*, Clarence N. Crapo, 601, Enterprise Buildings, Milwaukee, Wisc.

*Minn. Wireless Association—*Sec.*, R. K. Viles, Court House, Minneapolis, Minn.

*Montclair High School Radio Club—*Pres.*, Lloyd C. Mayers, 62, Christopher Street, Montclair, N.J.

*Monongahela Valley Radio Association—*Sec.*, A. G. Kismer, 809, Coleman Avenue, Fairmont, W. Va.

*Monterey Radio Association—*Vice-Pres.*, S. J. Wood, 512, Watson Street, Monterey, Calif.

*Montgomery County Radio Association—*Sec.*, F. H. Homsher, Box 34, North Glenside, Pa.

*Napa Amateur Radio Club—*Sec.*, E. W. Korf, 816, Main Street, Napa, Calif.

*New England Amateur Wireless Association—*Sec.*, W. E. Heckman, 119, Windermere Road, Auburndale, Mass.

*New Haven Radio Association—*Sec.*, R. E. Wilmott, 114, East Avenue, New Haven, Conn.

*New Mexico State College Radio Club—*Sec.*, C. H. Rutledge, State College, New Mexico.

Nirasco Radio Club—*Business Agent and General Manager*, R. D. Nicholls, Y.M.C.A., Nirasco.

*Nola Radio Club—*Sec.*, J. F. Preis, 1044 City Park Avenue, New Orleans, La.

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*Northampton Radio Club—*Pres.*, W. F. Arnold, 26, North Street, Northampton, Mass.

*Northern Ind. Radio Association—*Sec.*, Geo. E. Finch, Lock Box 543, Elkhart, Ind.

*Northwestern Indiana Radio Association—*Sec.*, J. D. Giles, 5668, E. State Street, Hammond, Ind.

*Northwestern Radio Club—*Sec.*, Robert Austin, 38, Sterling Avenue, Detroit, Mich.

*Northwestern Radio Association—*Sec.*, R. T. Galyean, 460, Miller Avenue, Portland, Ore.

*Norwich Radio Club—*Sec.*, L. H. Gordon, 161, Main Street, Alling Building, Norwich, Conn.

*Oshkosh Radio Club—*Pres.*, Ralph R. Miner, 430, N. Main Street, Oshkosh, Wisc.

*Peninsula Radio Club of San Mateo—*Sec.*, H. Maussen, 807, Prospect Row, San Mateo, Calif.

*Peoria Radio Club—*Sec.*, E. G. Shalkhauser, Bradley Institute, Peoria, Ill.

*Philadelphia Amateur Radio Association—*Sec.*, Harry J. Dunbar, 728, Arch Street, Philadelphia, Pa.

*Plattsburgh Wireless Club—*Sec.*, Jos. C. McIlwaine, 96, Broad Street, Plattsburgh, N.Y.

*Pomona Radio Association—*Sec.*, Howard E. Wright, 315, Alvarado Ct., Pomona, Calif.

*Portland Radio Association—*Sec.*, R. W. Pratt, Cumberland Mills, Maine.

*Premier Radio Club—*Sec.*, Thos. Kirmayer, Box 4, Grantwood, N.J.

*Progressive Radio Association—*Pres.*, Robert F. Keunert, 233, Menomines Street, Chicago, Ill.

*QRV Radio Association—*Pres.*, Chas. Wm. Vincent, Box 1044, Uniontown, Pa.

*Radio Association of the University of Vermont—*Sec.*, Leon G. Pollard, 194, So. Willard Street, Burlington, Vt.

*Radio Club of the Bronx—*Sec.*, Max Elenkrig, 1261, Franklyn Avenue, Bronx, N.Y.C.

*Radio Club of Brooklyn, N.Y.—*Pres.*, Chas. H. Hild, 2211, Bedford Avenue, Brooklyn, N.Y.

*Radio Club of the Carnegie Institute of Technology—*Sec.*, J. Wm. Kauffman, Carnegie Institute of Technology, Pittsburgh, Pa.

*Radio Club of Central High School—*Pres.*, D. B. Eckes, Central High School. Minneapolis, Minn.

*Radio Club of Jamaica—*Sec.*, J. Verne Cunningham, 44, Kingston Road, Jamaica, N.Y.

*Radio Association of Western N.Y.—*Sec.*, E. H. Kumpf, 41, Amsterdam Avenue, Buffalo, N.Y.

*Radio Club of Burlington—*Sec.*, H. H. Vaugh, 1316, Perkins Avenue, Burlington, Iowa.

The Radio Club of Electric Lighting Industries—*Sec.*, H. F. Rotchford, Radio Club, c/o New York Edison Co., 15th Street, and Irving Place, N.Y.

*Radio Club of Glen Ridge—*Pres.*, Howard Karig, 22, Ridgewood Avenue, Glen Ridge, N.J.

*Radio Club of Hartford—*Sec.*, J. C. Randall, 23, Harrison Street, Hartford, Conn.

*Radio Club of Mansfield—*Sec.*, C. S. Fernyak, Park Avenue, E. Mansfield, Ohio.

*Radio Club of Paterson High School—*Sec.*, H. C. Hogencamp, c/o High School, Paterson, N.J.

*Radio Club of Rutgers College—*Sec.*, F. W. Pettit, New Brunswick, N.J.

*Radio Club of Syracuse—*Sec.*, Donald C. Wood, 441, W. Onondaga Street, Syracuse, N.Y.

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*Radio Club of Tacoma—*Sec.*, Miss Winifred E. Dow, 2329, So. K. Street, Tacoma, Wash.

*Radio Club of the Y.M.C.A. of Orangies—*Sec.*, Edw. S. Meeker, 70, N. Arlington Avenue, E. Orange, N.J.

*Radio Engineering Society—*Sec.*, C. E. Urban, 26, Watsonia Boulevard, N.S. Pittsburgh, Pa.

*Radio Research Association—*Sec.*, H. Hoffman, 233, So. 3rd Street, Brooklyn, N.Y.

*Radio Research Club of N.Y. City—*Sec.*, Jonas Cohen, 789 E. 163rd Street, New York City.

*Radio Traffic Association—*Chairman*, W. S. Browne, 1265, E. 12th Street, Brooklyn, N.Y.

*Ravenswood Radio Association—*Sec.*, M. E. Wunderlick, 4533, No. Sawyer Avenue, Chicago, Ill.

*Regina Amateur Radio Association—*Sec.*, Harry Miller, 2226, Scarth Street, Regina, Saskatchewan.

*Ridge Radio League—*Sec.*, Robert W. Carter, Blue Island, Ill.

*Ridgewood Radio Club—*Sec.*, Chester A. Kornhoff, 104, So. Van Dien Avenue, Ridgewood, N.J.

*Rochester Radio Club—*Pres.*, Ralph D. Haire, 48, Holmes Street, Rochester, N.Y.

*Rockville Centre Radio Club—*Sec.*, Carlos Clark, 204, Lakeview Avenue, Rockville Centre, N.Y.

*Rocky Mountain Radio Association—Frederick L. Shaw, 2411, 15th Street, Denver, Colo.

*Rubber City Radio Club—*Sec.*, Levay M. Lind, 675, Hazel Street, Akron, Ohio.

*Rutherford Radio Club—*Pres.*, Richard C. Innes, 82, Home Avenue, Rutherford, N.J.

*San Antonio Radio Club—*Sec.*, G. T. Atchison, 372, Roosevelt Avenue, San Antonio, Texas.

*Scarsdale Wireless Association—*Pres.*, Franklin E. Welas, Scarsdale, N.Y.

*Scenic Highway Radio Club—Gus A. Gummeson, 503, N. 3rd Street, Clinton, Iowa.

*Sedalia Amateur Radio Club—*Pres.*, Otto S. McDaniel, Sedalia, Mo., 613, W. 7th Street.

*Seymour Radio Club—*Pres.*, E. S. Welch, 518, No. Pine Street, Seymour, Ind.

*Sheboygan Radio Association—*Sec.*, Melvin Herman, 1419, S. 9th Street, Sheboygan, Wisc.

*South California Radio Association—*Sec.*, Harold Duvall, 4965, Wadsworth Street, Los Angeles, Calif.

*South Jersey Radio Association—*Second Vice-Pres.*, Edw. B. Patterson, W. Walnut Avenue, Merchantville, N.J.

South Side Radio Association—*Sec.*, B. W. Stolte, 3554, S. Halstead Street, Chicago, Ill.

Southampton Radio Club—*Sec. and Treas.*, Clarence Deim, Water Mill, New York.

*Springfield Radio Association—*Act. Pres.*, Horace Tyson, 7, Pomona Street, Springfield, Mass.

Star Radio Club—*Sec.*, Joseph L. Whalen, 113, Philip Street, Coal Dale, Pa., U.S.A.

*Staunton Radio Club—*Sec.*, Arthur Klinger, Staunton, Ill. P.O. Box 546.

States Island Radio Club—*Sec.*, Gropp, 24, Osgood Avenue, Stapleton, S.I.

*Stoneham Radio Association—*Sec.*, Leonard Patridge, 12, Mt. Washington Street, Stoneham, 80, Mass.

*Stuyvesant Radio Club—*Sec.*, Murray Blum, 17, W. 116th Street, New York City.

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*St. Joseph Valley Radio Association—*Sec.*, V. A. Blormquist, 510, Sherman Avenue, South Bend, Ind.

*St. Louis Radio Association—*Sec.*, J. E. Fritz, 4880, Margaretta Avenue, St. Louis, Mo.

*St. Paul Central High School Radio Club—*Sec.*, Max Levy, 683, W. Central Avenue, St. Paul, Minn.

*St. Paul Y.M.C.A. Radio Club—*Sec.*, C. J. Otterholm, 993, Flandraw Street, St. Paul, Minn.

*Summit Radio Club—*Act. Sec.*, Norbert Nuber, 3001, Peach Street, Erie, Pa.

*Sunset Radio Club—*Sec.*, A. A. Hudgins, 845, B. Avenue, Coronada, Calif.

*Tech. Radio Club—*Sec.*, Edwin R. Kluss, 414, Moss Avenue, Oakland, Calif.

*Terre Haute Radio Club—*Sec. and Treas.*, Howard A. Derry, 1716, N. 8th Street, Terre Haute, Ind.

*The Butte Radio Club—*Sec.*, M. L. Gray, 1212, E. Second Street, Butte, Mont.

*The Cleveland Radio Association—*Sec.*, A. R. Tyler, 14001, Ardenall Avenue, E. Cleveland, Ohio.

*The Conneaut Radio Club—*Sec.*, Laurence Madison, 240, Centre Street, Conneaut, Ohio.

*The Hudson Amateur Radio Club—*Sec.*, Samuel Jackson, Jr., 345, W. 68th Street, New York City.

*The Limited Radio Association—*Sec.*, Chas. A. Prevot, 2029, Burling Street, Chicago, Ill.

*The Maplewood High School Radio Club—*Sec.*, Chas. Edw. Harrison, 7561, Ellis Avenue, Maplewood, Mo.

*The Morris County Radio Club—*Sec.*, Robert M. Lacey, 11, Millis Street, Morristown, N.J.

*The Mt. Sterling Radio Association—*Sec.*, Bernard Simon, Mt. Sterling, Ill.

*The North Shore Radio Club—*Sec.*, Walter Watts, 7418, Sheridan Road, Chicago, Ill.

*The QSA Radio Club—*Sec.*, Joseph A. Staples, Jr., 43rd. Street, Forest Hill, So. Richmond, Va.

*The Radio Amateur Club—*Sec.*, C. B. Sorgen, Carbondale, Ill.

*The Radio Association of Salem—*Sec.*, H. B. Churchill, Salem, Ore.

*The Radio Club—*Treas.*, Alfred C. Oechler, 55, Linden Avenue, Irvington, N.J.

*The South Bend Radio Research Club—*Pres.*, Allan Kalb, 806, Leland Avenue, South Bend, Ind.

*The Ypsilanti Radio Association—*Sec.*, Ned Wier, Route 2, Ypsilanti, Mich.

*Triangle Radio Society—*Sec.*, Thomas J. Whalen, 115, Broadway, Rochester, N.Y.

*Tri-County Radio Club—*Sec.*, Geo. C. Robinson, 657, North 8th Street, Richmond, Va.

*Tri-State Radio Association—*Sec.*, D. F. Baker, 3042, Cleinview Avenue, Cincinnati, Ohio.

*Troy Y.M.C.A. Radio Club—*Sec.*, J. D. McKnight, Troy, N.Y.

*Twin City Radio Club—*Pres.*, Edw. P. McShane, 42, Whipple Street, Lewiston, Maine.

*Union Central Radio Association—*Sec.*, Dorman D. Isreal, Apt. " Y " Hamilton Building, Cincinnati, Ohio.

*Union College Radio Club—*Sec.*, Leo C. Freedman, Schenectady, N.Y.

*United Electric and Wireless Association—*Sec.*, Edgar A. Green, 825, Cedar Street, Hagerstown, Md.

*University of California Radio Club—*Sec.*, L. B. Kennedy, 2616, Virginia Street, Berkeley, Calif.

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*University of Virginia Radio Club—*Sec.*, Francis Wm. Taylor, c/o Mrs. E. M. Page, University, Va.

*Utah Radio Association—*Sec.*, Eugene Pack, 501, So. 13th Street, E. Salt Lake City, Utah

*Valley City Radio Club—*Sec. and Treas.*, Leslie M. Duvall, Valley City, N. Dak.

*Waco Hertzian Society—*Vice-Pres.*, Henry M. Harris, Box 427, Waco, Texas.

*Warren Radio Association—*Pres.*, Edwin D. Strickland, 123, Canton Street, Warren, Pa.

*Washington Radio Club—*Sec. and Treas.*, H. A. Snow, 1656, Newton Street, N.W., Washington, D.C.

*Wauwatosa Radio Club—*Sec.*, Ralph Smith, 359, First Avenue, Wauwatosa, Wisc.

*Wayland Academy Wireless Club—*Sec.*, Wm. E. Hanna, Beaver Dam, Wisc.

*West Allis Radio Club—*Sec.*, Mark H. Doll, 602, 64th Avenue, West Allis, Wisc.

*West Haven Radio Association—*Pres.*, W. A. Rida, 810, Savin Avenue, W. Haven, Conn.

*Westfield Radio Association—*Sec.*, Clifford D. Warren, Middle Farms, Westfield, Mass.

*West Side Radio Club—*Pres.*, J. Q. Adams, 5410, Fulton Street, Chicago, Ill.

*Wireless Association of Atlantic City—*Sec.*, Harry J. Hemphill, Room 2, Maharba Buildings, Atlantic City, N.J.

*Wireless Association of Pa.—*Sec.*, Mrs. F. B. Chambers, 2046, Arch Street, Philadelphia, Pa.

*Worcester County Radio Association—*Pres.*, S. A. Waite, 49, Benefit Street, Worcester, Mass.

*Worcester North Radio Association—*Sec. and Treas.*, Dean A. Lyon, 54, Cottage Street, Leominster, Mass.

*Worcester Polytechnic Institute—*Sec.*, R. E. Cushing, Wireless Association, Worchester, Mass.

*" Y " Radio Club—*Sec.*, R. H. Schauer, 1009, E. Haley Street, Santa Barbara, Calif.

*Yates Radio Club—*Pres.*, C. Babcock, 112, Head Street, Penn Yan, N.Y.

*Y.M.C.A. Radio Club—*Sec.*, T. North, 1510, Laurel Avenue, St. Paul, Minn.

*Y.M.C.A. Radio Club—*Sec.*, H. W. Muller, 153, E. 80th Street, New York City.

*Y.M.C.A. Radio Club—*Sec.*, Clifford G. Fick, Sioux Falls, S. Dak.

*Y.M.C.A. Radio Club of Rome—*Sec.*, Stephen Zingerline, 105, W. Liberty Street, Rome, N.Y.

*Yonkers Radio Club—*Sec.*, Walter A. Remy, 356, Desmond Avenue, Bronxville, N.Y.

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CALL SIGNS OF BRITISH EXPERIMENTAL STATIONS

Call Letters.	Power in Watts.	Wave-lengths in Metres.	Hours of Working.	System.	Name and Address.
2 AA	—	—	—	—	Radio Communication Company (Slough Experimental Station).
2 AB	—	200 700 1,000	2000–2200	Spark, C.W. and Telephony	Capt. H. de A. Donisthorpe, London.
2 AF } **2 AG** }	—	—	2000–2200	C.W.	A. Rickard Taylor, 49, Idmiston Road, W. Norwood.
2 AH	—	—	2000–2200	C.W.	Oxford.
2 AK	—	300 600 800	—	Spark, C.W. and Telephony.	R.M. Radio, Ltd., Townslead Mills, Worcester.
2 AL	—	180 1,000	2000–2200	C.W. and Telephony.	W. Halstead, Briar Royd, Briar Lane, Thornton-le-Fylde.
2 AN	—	1,000	2115–2200 0930–1100 (Sunday)	C.W. and Telephony.	A. W. Sharman, Kelvin Lodge, 1 Morella Road, S.W.
2 AQ	—	180 1,000	—	Spark, C.W. and Telephony.	Davis, Thornton Heath, London, S.W.
2 AR	—	—	—	—	E. Gaze, 3, Archibald Street, Gloucester.
2 AU	—	—	—	—	A. C. Bull, 25, Fairland Road, West Ham, E.15.
2 AW	100	1,000 3,000	2000–2100	C.W. and Telephony.	H. H. Burbury, Crigglestone, Wakefield.
2 AX	10	180	1900–2100	Spark	Geo. Sutton, 18, Melford Road, S.E.22
2 AZ	—	1,000	1500–1600 2000–2100	Spark, C.W. and Telephony.	W. Le Queux.
2 BM	—	—	2000–2200	C.W. and Telephony.	J. H. A. Whitehouse, 25, Ennerdale Road, New Brighton, Cheshire.
. BXH	—	—	—	—	Capt. C. H. Bailey, Gliffaes, Crickhowell, Abergavenny.
2 BZ	10	1,000	2100–2300	C.W. and Telephony.	Basil Davis, Electric Pavilion, Marble Arch, W.1.
2 CH	10	1,000	Wednesday and Sunday, 1700–2100	C.W. and Telephony.	Science Society, The School, Oundle, Northants.
2 CI	10	180	2000–2200	Spark	R. Brooks King, Widcombe, Taunton.
2 CZ	10	180 1,000	2000–2100 1100–1200 (Sunday)	Spark, C. W., Tonic-Train and Telephony	C. Atkinson, 17, Beaumont Road, Leicester.
2 DC	10	180 1,000	2000–2200	C.W. and Telephony.	M. Child, 60, Ashworth Mansions, Maida Vale.
2 DD	10	120	1900–2000	Spark	A. C. Davis, 105, Brynland Avenue, Bristol.
2 DF	—	—	—	—	Mitchell's Electric and Wireless, Ltd., Peckham.
2 DG	10	180	1900–2000 (Monday to Friday). Other days various.	C.W. and Spark	W. Barnet, 63, Mount Road, Parkwood Springs, Sheffield.
2 DH	10	180	—	Spark and C.W.	W. Barnet, 63, Mount Road, Parkwood Springs, Sheffield. *Portable Set.*
2 DI	10	180	—	Spark and C.W.	W. Barnet, 63, Mount Road, Parkwood Springs, Sheffield. *Portable Set.*
2 DJ	10	1,000	2000–2200	C.W. and Telephony.	A. T. Lee, The Court, Alvaston, Derby.
2 DT	—	—	—	—	Barrow and District Wireless Association.

CALL SIGNS OF BRITISH EXPERIMENTAL STATIONS—(*continued*).

Call Letters.	Power in Watts.	Wave-lengths in Metres.	Hours of Working.	System.	Name and Address.
2 DX	10 & 50	180 1,000	1930–2130	C.W. and Telephony.	W. K. Alford, "Rosedene," Camberley, Surrey.
2 DY	—	—	—	—	F. Haynes, 157, Phillip Lane, S. Tottenham, N.15.
2 DZ	—	—	—	—	F. Haynes, 157, Phillip Lane, S. Tottenham, N.15.
2 FA	—	—	—	—	F. G. Bennett, 16, Tivoli Road, Crouch End, N.8.
2 FB	—	—	1900–2100	Telephony ..	W. Ison, Watford.
2 FC	—	—	—	—	London, S.E.
2 FG	—	180 1,000	2000–2200	Spark, C.W. and Telephony	L. McMichael, 32, Quex Road, W. Hampstead, N.W.
2 FH	10	300	1930–2100	C.W. and Telephony.	T. S. Rogers, 2, Park Hill, Moseley, Birmingham.
2 FL	100 50	180 1,000	2100–2300	Spark and C.W.	C. Willcox, 21, George Street, Warminster, Wilts.
2 FM	10	180 1,000	2000–2200	—	L. Baker, Ruddington, Notts.
2 FP	10	180 1,000	—	Spark, Telephony, C.W. and T.T.	F. Foulger, 118, Pepys Road, S.E.14.
2 FQ	—	180 1,000	—	Spark, C.W. and Telephony.	Burnham & Co.'s Experimental Station, Blackheath.
2 FR	Artificial aerial only.	180	Various	Spark	S. Rudeforth, 54, Worthing Street, Hull.
2 FU	10	180 1,000	2030–2230	Spark, C.W. and Telephony.	E. T. Manley, Jnr., 27, Home Park Road, Wimbledon Park, S.W.19.
2 FW	—	—	—	Spark	Rev. D. Thomas, St. Paul's B.P. Scouts, Bournemouth. *Also Portable Set.*
2 FX	—	—	2000–2100 (Monday to Friday). Other days various.	Spark, C.W., T.T. and Telephony.	H. C. Binden, Bournemouth.
2 FZ	10	180 1,000	1900–2100	Spark, C.W. and Telephony.	Manchester Wireless Society Headquarters, Albion Hotel, Piccadilly, Manchester. *Also Portable Set,* same details and call sign.
2 GD	10	For Indoor Transmissions only ..			Birmingham Wireless Experimental Club, Digbeth Institute, Birmingham.
2 GL	10	1,000	2100–2300	C.W. and Telephony.	W. J. Henderson, 2, Hollywood Road, S.W.10.
2 GP	—	—	2030–2230	C.W., T.T., Spark and Telephony.	W. Gaitland, Highbury, N.
2 GQ	10	180	1930–2130	Spark	1st Taunton Scouts, Parish Buildings, Wilton.
2 GR	—	—	1230–1300 1730–1900	—	T. Forsyth, Ashington.
2 GS	—	—	—	—	T. Forsyth, Ashington. *Portable Set.*
2 GU	10	180 1,000	2000–2200	—	Halifax Wireless Club.
2 GV	10	180 1,000	1900–2000	Spark, C.W. and Telephony.	Rev. J. Rigby, St. Lawrence Vicarage, Bristol.
2 GW	10	—	1930–2130	Spark, C.W. and Telephony.	Allan Cash, Foxley Mount, Lymm, Cheshire.
2 GZ	—	180 1,000	—	C.W. and Spark	A. L. Megson, Bowdon.
2 HA	—	180 1,000	—	C.W. and Spark	A. L. Megson, Bowdon. *Portable Set.*
2 HB	10	180 1,000	2000–2200	C.W. and Spark	L. H. Lomas, Macclesfield.
2 HC	10	180 1,000	1200–1300 2100–2200	C.W. and Spark	J. W. White, Windcombe Lodge, Bucklersbury, nr. Reading.

CALL SIGNS OF BRITISH EXPERIMENTAL STATIONS—(*continued*).

Call Letters.	Power in Watts.	Wave-lengths in Metres.	Hours of Working.	System.	Name and Address.
2 HG	—	—	1230–1300 1730–1900	—	T. Boutland (Senr.), Ashington.
2 HH	—	—	1230–1300 1730–1900	—	T. Boutland (Jnr.), Ashington.
2 HK	—	—	—	—	A. A. Campbell Swinton, Chester Square, W.
2 HP	10	180 1,000	2000–2200	C.W. and Telephony.	H. C. Woodhall, 10, Holborn House, E.C.1.
2 HQ	10	180	2200–2400	C.W. and Spark	A. W. Faucett, 11, Leigh Road, Clifton, Bristol.
2 HR	10	180	1700–1900	C.W. and Telephony.	F. O. Read & Co., Ltd., 13-14, Gt. Queen Street, Kingsway, W.C.2.
2 HS	10	180	1900–2100	C.W., Telephony and Tonic Train.	G. W. Hale. 51, Grafton Road, New Malden, Surrey.
2 HT	—	180 1,000	2000–2200	Spark, C.W. and Telephony.	R. H. Klein, 18, Crediton Hill, W Hampstead, N.W.6.
2 HX	—	—	0900–1030 2000–2100	Spark, C.W. and Telephony.	F. A. Love, Ivydene, Guildford Park Road, Guildford.
2 IB	10	1,000	2000–2200	C.W. and Telephony.	W. Bemrose, Littleover Hill, Derby.
2 ID	10	180	1530–1630 2030–2130	C.W. and Spark	E. S. Firth, Thames Ditton.
2 IF	10	1,000	2000–2100	C.W. and Telephony.	S. W. Bligh, 2, North Lane, Canterbury.
2 IH	—	—	—	—	Technical College, Cardiff.
2 II	10	180	2000–2200	Spark	Southport Wireless Society, 74A, Kensington Road, Southport.
2 IJ	—	—	—	—	Southport Wireless Society, 74A, Kensington Road, Southport. *Portable Set.*
2 IK	10	1,000	1900–2000 and any time Saturday and Sunday.	C.W. and Telephony.	County High School for Boys, Altrincham, Cheshire.
2 IL	10	1,000	—	Telephony	H. R. Goodall, "Fernlea," Winchester Road, Bassett, Southampton.
2 IM	10	180 1,000	2000–2200	C.W. and Spark and Telephony	J. E. Fish, "Thornleigh," Thornton-le-Fylde, nr. Blackpool.
2 IQ	—	1,000	—	C.W. and Telephony.	W. A. Ward, 26, Marlborough Road, Sheffield.
2 IS	—	—	—	—	Rev. H. W. Doudney, St. Luke's Vicarage, Bath.
2 IT	—	—	—	—	Rev. H. W. Doudney, St. Luke's Vicarage, Bath. *Portable.*
2 IU	10	180	2100–2300	—	G. A. E. Roberts, Twyford, Winchester.
2 IV	10	180 1,000	1900–2100	Spark, C.W. and Telephony.	L. F. White, Priory Road, Knowle, Bristol.
2 IW	10	180	2100–2300	—	G. R. Marsh, Twyford, Winchester.
2 IX	10	1,000	2000–2200	C.W. and Telephony.	S. G. Taylor, Littleover, Derby.
2 IY	10	180 1,000	1800–1900 2100–2200	C.W. and Telephony.	J. Briggs, City School of Wireless Telegraphy, 66½, Corporation Street, Birmingham.
2 JF	10	180 1,000	1930–2130	Spark, C.W. and Telephony.	C. G. Williams, 22, Scholar Street, Sefton Park, Liverpool.
2 JG	—	—	—	—	W. A. Seed, Crigglestone, nr. Wakefield.
2 JJ	10	180 1,000	1930–2130	Spark, C.W. and Telephony.	C. Worthy, 4, Riversdale Road, Egremont, Wallasey.
2 JK	10	180 1,000	2030–2230	Spark, C.W., T.T. and Telephony.	Philip R. Coursey, Woodland Villas, 138, Muswell Hill Road, N.10.
2 JL	10	180 1,000	2130–2330	Spark, C.W. and Telephony.	G. G. Bailey, The Beeches, Cowley Middlesex.

IGNS OF BRITISH EXPERIMENTAL STATIONS—(*continued*).

Power in Watts.	Wave-lengths in Metres.	Hours of Working.	System.	Name and Address.
10	180 1,000	—	Spark, C.W. and Telephony.	G. G. Blake, 10, Onslow Road, Richmond, Surrey.
10	180 1,000	Various	Spark, C.W. and Telephony.	J. W. Whiteside, 30, Castle Street, Clitheroe, Lancs.
—	180 1,000	—	Spark, C.W. and Telephony.	M. C. Ellison, Huttons Ambo Hall, York.
10	180	2000–2200	Spark, C.W. and Telephony.	E. J. Pearcey, 610, Fulham Road, S.W.
10	180 1,000	2000–2200	Spark, C.W. and Telephony.	A. G. Robbins, Station Road, Epping.
10	1,000	2100–2200	C.W. and Telephony.	J. R. Barrast, Westgate Court, Canterbury.
10	1,000	1900–2100 Weekdays, 1100–1200 Sundays.	C.W. and Telephony.	L. Vizard, 12, Seymour Gardens, Ilford.
10	1,000	2030–2230	C.W. and Telephony.	R. D. Spence, Craighead House, Huntly, Aberdeenshire.
10	180	1900-2300	Spark	N. Curtis, Belvedere West, Taunton.
10	180	1930–2130	C.W., Telephony and T.T.	W. E. Earp, 675, Moore Road, Mapperley, Nottingham.
—	—	—	Spark	Prof. Wilson, University of London, King's College.
10	180 1,000	2000–2200	C.W., T.T. and Telephony.	P. Denison, Rostellan, Saville Park, Halifax, York.
10	1,000	2100–2300 1600–1800 (Sunday)	C.W. and Telephony.	J. Partridge, Park Road, Merton, S.W.19.
10	180 1,000	Various	Spark, C.W. and Telephony, T.T., and Arc.	A. E. Hay, "Glendale," Abernant, Aberdare.
10	180	1900–2100 (Sundays : 1130–1230 2030–2130)	—	Hutchinson & Co. (F. Pinkerton), 101, Dartmouth Road, Forest Hill, S.E.23.
10	180	1900–2100	Spark	F. Pemberton, 50, Peak Hill, Sydenham.
Artificial aerial only.	180	Various	Spark	C. Stainton, 44, Kimberley Street, Hull.
Artificial Aerial only.			C.W. and Telephony.	A. B. Day, Finchley.
10	180 1,000	2000–2200 Weekdays, 1100–1300 Sundays.	C.W. and Telephony.	C. S. Baynton, 48, Russell Road, Moseley, Birmingham.
10	—	1830–1915 2100–2200	—	Wolverhampton (communications to Taylor, Relief Motor Co., Ltd., Cleveland Street, Wolverhampton.
10	180 1,000	1600–1630 2030–2100 2200–2300	C.W. and Telephony.	E. Edmonds, 2, Yew Tree Road, Edgbaston, Birmingham.
—	180 1,000	2000–2200	Spark, C.W. and T.T.	J. E. Nickless, 83, Wellington Road, Snaresbrook, E.11.
10	180 1,000	1830–2030	Spark, Telephony, C.W. and T.T.	A. J. Selby, 66, Edward Street, Burton-on-Trent.
—	1,000	2000–2200	C.W. and Telephony.	W. J. Crampton, Weybridge.
—	150, 180 1,000	1930–2130	C.W. and Telephony.	W. R. Burne, Springfield, Thorold Grove, Sale, Cheshire.
10	180 1,000	2000–2200	C.W. and Telephony.	L. Pollard, 209, Cunliffe Road, Blackpool.
10	180 1,000	2000–2200	Spark, C.W. and Telephony.	B. Clapp, Meadmoor, Brighton Road, Purley.
—	180 1,000	1900–2000 2100–2200	C.W. and Telephony.	H. F. Yardley, 121, Victoria Road, Headingley, Leeds.

CALL SIGNS OF BRITISH EXPERIMENTAL STATIONS—(*continued*).

Call Letters.	Power in Watts	Wave-lengths in Metres	Hours of Working.	System.	Name and Address.
2 LB	—	180 1,000	1900–2000 2100–2200	C. W. and Telephony.	H. F. Yardley, 6, Blenheim Terrace, Leeds.
2 LF	—	—	2100–2300	Spark and C.W.	P. Harris, Chilvester Lodge, Calne, Wilts.
2 LG	10	180 1,000	—	C.W.	H. Whitfield, The Glen, Primrose Lane, Hall Green, Birmingham.
2 LI	—	180 1,000	2000–2200	Spark, C.W. and Telephony.	H. E. Wilkinson, Lonsdale Road, N.W.6.
2 LK	10	180	2000–2200	Tonic Train and C.W.	S. Kniveton, Brooklands, Normanton, Yorks.
2 LL	10	180	2000–2200	Tonic Train and C.W.	S. Kniveton, Brooklands, Normanton, Yorks.
2 LP	10	180 1,000	Thursdays and Saturdays, 1500–1600 2000–2100 Other days, 2000–2100 2200–2300	Spark, C.W., and Telephony.	A. W. Knight, 26, Stanbury Road, S.E.
2 LR	10	1,000	—	C.W. and Telephony.	John Scott-Taggart, 6, Beattyville Gardens, Ilford.
2 LU	10	150	—	C.W. and Telephony.	W. A. Appleton, Wembley Park.
2 LV **2 LW**	—	180 1,000	Mondays, 2030–2130 Other times by appointment.	Spark, C.W., and Telephony.	W. R. H. Tingey, Queen Street, Hammersmith.
2 LY	10	1,000	1230–1330 2230–2330	Telephony ..	H. H. Thompson, 59, Redlands Road, Penarth, Glam.
2 LZ	10	180 1,000	Weekdays, 1930–2130 Sundays, 1100–1200 2000–2100	Spark, C.W., and Telephony.	F. A. Mayer, Stilemans, Wickford, Essex.
2 MA	10	180	Monday to Friday, 2000–2200 Saturdays and holidays at all times.	Spark	P. S. Savage, 14/16, Norwich Road, Lowestoft.
2 MB	10	180 1,000	1930–2130	C.W. and Telephony.	E. H. Jeynes, 67, St. Paul's Road, Gloucester.
2 MD	10	180 1,000	2000–2200 Wednesday and Saturday.	Spark, C.W. and Telephony.	C. Chipperfield, Victoria Road, Oulton Broad, Lowestoft.
2 MF	—	1,000	Various	C.W. and Telephony.	Marconi Scientific Instrument Co., Ltd., 21/25, St. Anne's Court, Dean Street, W.1.
2 MG	10	180 1,000	2000–2100 2130–2230 Holidays, 1600–1700 2000–2100	C.W. and Telephony.	C. E. Millar, Arndene, Bearsden, nr. Glasgow.
2 MH	10	180	—	Telephony ..	A. Lawton, Brown Edge Vicarage, Stoke-on-Trent.
2 MI	10	180 1,000	1030–1230	Spark, C.W. and Telephony.	L. McMichael, Stag Works, Kilburn, N.W.
2 MK	10	180 1,000	1800–2000	—	A. W. Hambling, 23, Winchester Avenue, Brondesbury, N.W.6.
2 ML	10	180 1,000	1930–2130	Spark, C.W. and Telephony.	R. C. Clinker, Bilton, Rugby.
2 MO	—	180 1,000	—	Spark, C.W. and Telephony.	Burnham & Co.'s Experimental Station, Chiswick.
2 MR	10	180 1,000	2030–2230	Spark, C.W. and Telephony.	R. H. Reece, The Corner House, 6a, Addison Gardens, London, W.14.
2 MS	10	180 1,000	1800–1900 2100–2200	C.W., Spark and Telephony.	R. H. Reece, "Basketts," Birchington, Kent.
2 MT	1,000	180 450 700 1,000	1900–1930 (Tuesdays)	Spark C.W. and Telephony.	Marconi Scientific Instrument Co. (near Chelmsford) Station for specially authorised transmissions to amateurs.

[SI]GNS OF BRITISH EXPERIMENTAL STATIONS—(*continued*).

Power in Watts.	Wave-lengths in Metres.	Hours of Working.	System.	Name and Address.
10	180 1,000	2200	C.W. and Spark	H. M. Hodgson, Clifton House, Hartford, Cheshire.
—	—	2130–2230 Except Mon., Tuesday and Thursday.	—	J. Mayall, "Burfield," St. Paul's Road, Gloucester.
10	1,000	1800–2000 2100–2400	C.W. and Telephony.	H. Frost, Longwood, Barr Common, Walsall.
—	—	—	—	J. W. Barnaby, Sylvan House, Broad Road, Sale, Cheshire.
10	180 1,000	1700–1800 2100–2200	C.W. and Telephony.	O. R. C. Sherwood, 41, Queen's Gate Gardens, S.W.
10	180 1,000	—	Artificial Aerial	R. H. Lyne, Dartford and District Wireless Society.
—	—	—	—	Lee, S.E.12.
—	180 1,000	2100–2300	C.W. and Telephony.	G. Marcuse, Little Coombe, Coombe Dingle, near Bristol.
10	180 1,000	—	—	Brig. General Palmer, Epping.
10	200 1,000	1900–2000 Monday and Friday.	C.W., Tonic Train and Telephony.	H. R. Adams, Crescent Cabinet Works, Walsall.
—	180 1,000	1900–2100	C.W. and Telephony.	H. S. Treadwell, Middleton Cheney, Banbury, '*Phone*, 3 Y *Banbury*.
—	—	—	—	Morton, Kingston.
—	—	—	—	J. K. Hassall, "Eureka Lodge," Rotherwood, Ashby-de-la-Zouch.
10	180 1,000	1900–2100 Holidays, 1500–1600 1900–2000	C.W., T.T., and Telephony	J. N. C. Bradshaw, Bilsboro', near Preston.
10	180 1,000	2000–2200	Spark, C.W. and Telephony.	H. C. Trent, Secondary School, Lowestoft.
Artificial Aerial only.			C.W., Telephony and T.T.	Colin Bain, Newcastle-on-Tyne.
—	1,000	—	C.W. and Telephony.	H. S. Walker, Park Lodge, Brentford, Middlesex.
10	180 1,000	1900–2100 Monday–Saturday 1100–1200 1900–2100 Sunday.	Spark, C.W. and Telephony.	Major H. C. Parker, 56, Stern-Hall Street, Walthamstow, E.17.
10	180 1,000	Friday to Monday 2000–2200 Other days 1500–1700	C.W. and Telephony.	Capt. E. J. Hobbs, 4th Tank Battn., Wareham.
10	180	—	Spark	F. Foulger, S.E.14.
10	180 1,000	1900–2100	Spark, C.W. and Telephony.	Loughborough College, Leicestershire.
10	1,000	1730–1930	C.W. and Telephony.	A. E. Whitehead, "Hollingwood," Kings Ride, Camberley, Surrey.
10	180	1930-2130	C.W. and Telephony.	J. H. Gill, 18, Fourth Avenue, Sherwood Rise, Nottingham.
10	180 1,000	Weekdays, 2100–2200 Saturday and Sunday, 1600–1700	Spark, C.W. and Telephony.	C. R. W. Chapman, "Nirvana," 44, Chaplin Road, Wembley.
10	180 1,000	1830–1930 2130–2230	C.W., T.T. and Telephony.	A. Hewins, 42, St. Augustine Avenue, Grimsby.
—	—	—	—	Balham.

[Por]*table Set* for use within 10 miles radius of Loughborough College. Same particulars as for [firs]t set.

CALL SIGNS OF BRITISH EXPERIMENTAL STATIONS—(*continued*).

Call Letters.	Power in Watts.	Wave-lengths in Metres.	Hours of Working.	System.	Name and Address.
2 QK	10	180 1,000	2000–2200	C.W. and Tele-phony.	J. Bever, 85, Emm Lane, Bradford,
2 QL	—	300 700	Various	C.W. and Tele phony.	R. J. Hibberd, Grayswood School, Haslemere, Surrey.
2 QN	10	180 1,000	Weekdays, 1930–2030 2130–2230 Sundays, 1000–1100 1930–2030	Spark, C.W. and Telephony.	A. Hobday, Flint House, Northdow Road, Margate.
2 QQ	—	—	—	—	Burnham & Co., Experimental Station, Wembley.
2 QS	10	180 1,000	2000–2200	Spark, C.W. and Telephony.	S. Ward, "Ravenswood," 339, Brixton Road, S.W.9.
2 QU	—	—	—	—	Blackheath.
2 QV	10 100	—	Evenings and all Saturday and Sunday.	Telephony ..	Altrincham Wireless Society, Breeze Crest, Plane Tree Road, Hale, Cheshire.
2 QY	—	Below 150	—	—	London, N.W.6.
2 RH	10	160	1930–2030 2130–2230	Spark	H. A. Pound, 101, High Street, Broadstairs.
2 SF	180	— 1,000	—	C.W., T.T. and Telephony	C. Midworth, 4c, Vicarage Mansions, West Green, N.15.
2 SH	Artificial Aerial only.			C.W., T.T. and Telephony.	F. L. Hogg, 37, Bishops Road, N.6.
2 SK	—	—	—	—	K. G. Styles, 52, Jerningham Road, S.E.14.
2 SL	—	—	—	—	A. G. Styles, "Kitscot," Maidstone, Kent.
2 VW	—	180 1,000	2000–2200	Spark, C.W. and Telephony.	V. Watson, Featherstone, Forest Hall, Newcastle-on-Tyne.

LIST OF WIRELESS TELEGRAPH COURSES IN COLLEGES AND SCHOOLS

(N.B.—Those schools marked with an asterisk (*) are devoted to the teaching of Radiotelegraphy and Telephony.)

School of College.	Duration of Course.	Fee.	Hours of Attendance.	Age (Most suitable). Years.	Remarks.
***AUSTRALIA** Marconi School of Wireless, 97, Clarence Street, Sydney, N.S.W., and 422/4, Little Colins Street, Melbourne, Vic.	8 months (Day), 16 months (Evening)	£50	0930–1630 1930–2130	18–26	Apparatus :—Marconi quenched spark and aircraft installation.
BELGIUM *Antwerp School of Radiotelegraphists, 5-7, Rue du Lombard, Antwerp, Belgium.	9 months	—	—	17–24	Schools owned by the Société Anonyme Internationale de T.S.F. for the training of operators required for service on board Belgian merchant vessels.
*Ostend School of Radiotelegraphists, Caserne des Pompiers, Rue de Bruges, Ostend, Belgium.	9 months	—	—	17–24	
BOLIVIA *Radiotelegraphic School, La Paz, Bolivia.	—	—	—	—	This school is under the direction of M. Humberto Asin, the Superintendent of Radiotelegraphy in Bolivia.
BRAZIL *Marconi School, 107, Rua 1° de Março, Rio de Janeiro.	—	35 Milreis (monthly)	1300–1600	18–25	This school is conducted by Marconi's Wireless Telegraph Co., Ltd.
CANADA *Marconi Wireless Telegraph Co. of Canada, Ltd., 93, King Street, East, Toronto.	—	$20·00 monthly (Day Classes). $10·00 monthly (Night Classes).	0930–1200 1330–1600 (Saturday excepted). 1930–2130 (Monday, Wednesday and Friday).	16 upwards.	½ kw. Canadian Marconi Cabinet, ½ kw. Canadian Marconi W/T. Set.
*Cassan's Wireless School, Toronto, Ontario.	—	$20·00 monthly (Day Classes). $10·00 monthly (Night Classes).	0930–1600 (Saturday excepted). 1930–2130 (Monday, Wednesday and Friday).	No age limit.	½kw. Marconi open type.
*Shaw's Wireless School, Toronto, Ontario.	—	$20·00 monthly (Day Classes). $10·00 monthly (Night Classes).	0900–1600 0900–1200 (Saturday) 1930–2130 (Monday, Wednesday and Thursday).	No age limit.	½kw. Canadian Marconi Cabinet.

LIST OF WIRELESS TELEGRAPH COURSES—*continued.*

School of College.	Duration of Course.	Fee.	Hours of Attendance.	Age (most suitable). Years.	Remarks.
*Marconi's Wireless Telegraph Co. of Canada, Ltd., Montreal, Quebec.	—	$15·00 monthly (Afternoon Classes). $10·00 monthly (Evening Classes).	1400–1700 (Daily) 1930–2200 (Monday, Wednesday and Friday, Saturday excepted).	16 upwards.	School located at Marconi factory, all types of apparatus available.
Canadian School of Telegraphy (Wireless, Cable and Landline Telegraphy), Halifax, N.S.	12 months	$100	0900–1200 1400–1600 (Daily) 1930–2130 (Nightly).	16–25	Marconi apparatus.
Western Collegiate Institute, Ltd., 119, Pender Street, W. Vancouver, B.C.		$25·00 monthly (Day Course). $10·00 monthly (Two nights per week).	0930–1530 (Daily) 1930–2130 (Nightly) (Saturday excepted).	15 upwards.	Marconi ½kw. cabinet set.
Kelvin Technical High School, Winnipeg.	—	$2·00 per term which fee is returned if student attends ¾ of lectures.	1930–2130 (Three Evenings Weekly). (No day classes).	14 upwards.	Composite apparatus.
St. John's College, Winnipeg.		$2·00 per term which fee is returned if student attends ¾ of lectures.	1930–2130 (Three Evenings Weekly) (No day classes).	14 upwards.	
CHINA					
At the Board of Communications, Chiao-tung-pu, Pekin.	—	—	0930–1130 1430–1630	17–22	Devoted solely to the teaching of wireless telegraphy. This school is used only for the training of engineers and operators in the employ of the Board of Communication, hence no fees are charged.
At the Board of War, Board of War, Pekin.	—	—	—	16–25	English is also taught at this school, in addition to wireless telegraphy and telephony. This school is used for training officers and men of the Army.
FRANCE					
*Ecolé de Radiotélégraphie du Champ de Mars, 69, Rue Fondary, Paris, (15e).	5–6 months	550 frs. [2]	Postal [1]	15–16	[1] Course mainly postal, but attendance arranged if desired. [2] Plus 20 per cent. out of France.
Ecolé Practique de Radio-electricité, 57, Rue de Vauves, Paris (14e).	11 weeks 5 months 5 months 11 weeks	—	6 hours per day. 2 hours per day. Correspondence. 1½ hours per day.		Eight days in the laboratory.
JAPAN					
Telegraph Training School, Meguro, Tohiyo	—	—	—	—	Jointly controlled by the telegraph and wireless groups.

LIST OF WIRELESS TELEGRAPH COURSES—*continued.*

School of College.	Duration of Course.	Fee.	Hours of Attendance.	Age (most suitable). Years.	Remarks.
GREAT BRITAIN					
*2nd Lt. E. Redpath, 19, Niger Street, Barrow-in-Furness.	5 complete lessons.	3 guineas	Postal	—	Postal Instruction Course in C.W. Wireless. Endorsement of existing P.M.G.'s Certificates.
Northern Polytechnic Institute, St. John Street, Clerkenwell, London, E.C.	—	30s.	Evenings (Various).	—	
International Correspondence Schools, Ltd., International Buildings, Kingsway, London, W.C.2.	Until proficient (max. allowed, 5 years).	17 guineas (Elementary Course, 10 guineas).	Postal	17–23	
British School of Telegraphy, Ltd., 179, Clapham Road, London, S.W.	12–15 months	—	0930–1630	17–24	Equipped Marconi's Wireless Telegraph Co., Ltd.
Leith Nautical College, Commercial Street, Leith, Edinburgh.	18–24 months.	£6	1000–1600 (Day). 1900–2100 (Evenings Wednesday excepted).	16–16½	
North Wales Wireless Schools, The Wireless College, Carnarvon and Colwyn Bay.	8–12 months.	Sea Course, 22 guineas. Land Course, 28 guineas.	0930–1230 1330–1530 No afternoon classes Tuesdays and Saturdays).	—	
*London Radio College, Stafford House, 82-83, High Street, Brentford.	12 months	35 guineas	0930–1230 1400–1700 (Saturday excepted).	15–24	
London Telegraph Training College, Ltd., 262, Earl's Court Road, London, S.W.5.	45 weeks (30 hours per week).	40 guineas (Day Course). 20 guineas (Evening Course).	0930–1230 1330–1630 (Saturday excepted). 1800–2000 (Saturday excepted).	16–24	
Technical School, Tavistock Road, Plymouth.	2 years	10 guineas	0920–1225 1400–1700 (Saturday excepted).	16	
*City School of Wireless Telegraphy, Ltd., 61, High Street, Manchester.	12 months (Day) 18 months (Evening).	21 guineas (Day Course). 15 guineas (Evening Course).	0900–1230 1400–1630 1900–2100 (Wednesday afternoons and Saturdays excepted).	18–24	There is also a Postal Instruction Course, fee £10, duration 3 months.
Limerick School of Wireless and Inland Telegraphy, 2, Catherine Place, Limerick.	9–12 months	17 guineas	1000–1330 1600–1900	17–25	
*Marconi School, Marconi House, Strand, London, W.C.2.	—	—	—	—	Private School.
*South Wales and West of England Wireless Training College, Ltd., Market Buildngs, St. Mary's Street, Cardiff	12 months	25 guineas (Day Course). 15 guineas (Evening Course).	0930–1230 1400–1630	17	

LIST OF WIRELESS TELEGRAPH COURSES—*continued.*

School of College.	Duration of Course.	Fee.	Hours of Attendance.	Age (most suitable). Years.	Remarks.
Municipal College, The Town Hall Square, Portsmouth.	1 or 2 years	5 guineas per session.	0900–1200 1400–1700 (Saturday excepted).	—	The one-year course is intended for students who have some electrical knowledge, and who are not less than 17 years of age.
Naval School, T.S. *Mercury*, Hamble, Hants.	1–3 years	1 guinea per quarter.	2–3 hours per week.	13–15	Wireless forms only a part of the training.
Northern Wireless College and Cable School, 8, Corporation Street, Belfast.	8 months (or until qualified). 10 months	30 guineas 20 guineas	0930–1230 1400–1630 1900–2100	16½–24	Under normal conditions amateur classes are held each Wednesday. It is hoped to reinstate these shortly.
Surrey Education Committee, Grangwood School, Haslemere, Surrey.	12 months	None	0900–1200 1330–1600	12–15	Course is in conjunction with school curriculum, telegraph and telephone demonstration apparatus.
***The British Radio Correspondence College, 100, Lancaster Road, East Ham, London, E.C.**	No limit	—	Correspondence Course.	16–35	
NEWFOUNDLAND					
***Marconi Wireless Telegraph of Canada, Ltd., St. John's, Newfoundland.**	—	—	1000–1200 1500–1700 (Daily).	15–25	Marconi apparatus.
SPAIN					
***Radio School, Plaza Gaspar del Pino No. 3, Cadiz.**	6 months	—	1600–1900 2100–2300	15–25	
***Preparatoria Telégrafos, Trinquete de Caballeros No. 18, Valencia.**	—		0900–1300 (Special hours if so desired).	16 upwards.	
***Academia Bellido, Calle del Mar 10, Valencia.**	9 months	—	0900–1300	16 upwards).	
***Academia, Teverga-Mas-Serrano, Luna 5, Madrid.**	—	—	17–21	15–30	
UNITED STATES					
***Radio Institute of America, 326, Broadway, New York.**	4–6 months	$20 month $15 month	1300–1700 1930–2130 (Saturday excepted).	16	Fully equipped laboratory.
***Radio Institute of America, New Call Building, New Montgomery Street, San Francisco, California.**	—	—	1300–1700 1930–2130 (Saturday excepted).	—	
***New York Wireless Institute, 258, Broadway, New York.**	—	—	(Correspondence Courses only).	16–30	Telegraphy course, 20 lessons. Telephony course, 5 lessons.
Philadelphia School of Wireless Telegraphy, 1,533, Pine Street, Philadelphia, Penna.	6 months	—	0930–1230 1930–2130 (Saturday, Tuesday, and Thursday evenings excepted).	18–30	
***National Radio Institute Inc., 1345, Pennsylvania Avenue.**	4–8 months	—	0800–1000 1400–1600 1900–2100 (Saturday excepted).	—	

LIST OF WIRELESS TELEGRAPH COURSES—*continued.*

School or College.	Duration of Course.	Fee.	Hours of Attendance.	Age (most suitable). Years.	Remarks.
*National Radio Institute Inc., corner Franklin and Howard Streets, Baltimore, Md.	4–8 months	—	0800–1000 1400–1600 1900–2100 (Saturday excepted).	—	
*Y.M.C.A. Radio School, 153, East 86th Street, New York, N.Y.	6 months (Day). 10 months (Evening).	—	0900–1500 1930–2130	20	
Dodge's Radio Institute, Valparaiso, Indiana.	5–6 months unlimited.	$85 $115	0800–1200 1300–1700 (Saturday excepted).	17–20	The Institute is a boarding establishment. Approximate board lodging, $6·85 per week. Fully equipped laboratory.
Eastern Radio Institute, 899, Boylston Street, Boston, Mass.	Complete Course 6 months. Advanced Course, 3 months. Complete Course, 9 months. Advanced Course, 6 months.	$120 $60 $90 $60	0900–1300 (Saturday excepted). 0900–1300 (Saturday excepted). Monday Wednesday and Friday, 1900–2100 Monday, Wednesday and Friday, 1900–2100	—	
*Southern Wireless Institute Inc., 423-425, Courtland Street, Baltimore, Md.	6 months (Day). 8 months (Night).	—	0900–1500 1900–2100	18	
*Central Radio School, 316, East 14th Street, Kansas City, Mo.	4 months	—	0800–1130 1330–1530 (Additional work in Experimental Station).	—	
Oregon Institute of Technology, Portland, Oregon.	6 months (or until examination passed).	$25·00 (Month). $12·50 (Evening), plus a deposit of $8·50.	0845–1310 (Saturday excepted).	—	Operated by the Portland, Oregon Y.M.C.A.
Y.M.C.A. Technical Schools, Central Building, Y.M.C.A. of Philadelphia, 1,421, Arch Street, Philadelphia, Pa.	6 months	$15·00 (Monthly). $85·00 (6 months in advance).	1930–2200 (Monday, Wednesday and Friday).	Any age.	
*School of Radiotelegraphy Dept. of Education, Y.M.C.A., Seattle, Wash.	6 months	—	0900–1600	16–25	
*Massachusetts Radio and Telegraph School, Inc., 18, Boylston Street, Cor. Washington, Boston 11, Mass.	6–7 months (Day). 9 months approx. (Evening).	$20·00 (Monthly). $100·00 (in advance). $10·00 (monthly).	0900–1300 (Saturday excepted). 1900–2100 (Monday, Wednesday and Friday).	16 upwards.	
VENEZUELA					
National School of Radiotelegraphy, Caracas, Venezuela.	—	—	—	—	For the provision of native operators for the Venezuelan Radiotelegraphic service.

CODE SECTION

(A) The Morse Code.

THE MORSE CODE

Two forms of Morse Code are in use, the "Continental Morse Code," and the "American Morse Code." The latter is now only officially recognised for use in land line telegraphs in America, so that the Continental Code is used universally in Radio work.

Continental Morse is a dot and dash system, every letter or symbol consisting of a combination of these. Considering as an element either a dot or a dash, no ordinary unaccented letter is represented by more than four elements. Some punctuation signs, numerals and whole words are represented by more than four elements.

Rules for formation of Continental Morse code:

These rules apply irrespective of the speed of transmission.

(1) The time occupied by a dash should be equal to that occupied by three dots.

(2) The time occupied by the interval between two elements of one letter or other symbol should be equal to the time occupied by one dot.

(3) The interval between two letters in a word should be equal to the time occupied by three dots.

(4) The interval between two words should be equal to the time occupied by five dots.

Letters.

	Continental Morse.		American Morse.
a	• —	a	• —
ä	• — • —		
á, à	• — — • —		
b	— • • •	b	— • • •
c	— • — •	c	• • •
ch	— — — —		
d	— • •	d	— • •
e	•	e	•
é	• • — • •		
f	• • — •	f	• — •
g	— — •	g	— — •
h	• • • •	h	• • • •
i	• •	i	• •
j	• — — —	j	— • — •
k	— • —	k	— • —
l	• — • •	l	━━
m	— —	m	— —
n	— •	n	— •
ñ	— — • — —		
o	— — —	o	• •
ö	— — — •		
p	• — — •	p	• • • • •
q	— — • —	q	• • — •
r	• — •	r	• • •
s	• • •	s	• • •
t	—	t	—
u	• • —	u	• • —
ü	• • — —		
v	• • • —	v	• • • —
w	• — —	w	• — —
x	— • • —	x	• — • •
y	— • — —	y	• • • •
z	— — • •	z	• • • •

Figures.

Continental Morse.		American Morse.	
1	· — — — —	1	· — — ·
2	· · — — —	2	· · — · ·
3	· · · — —	3	· · · — ·
4	· · · · —	4	· · · · —
5	· · · · ·	5	— — —
6	— · · · ·	6	· · · · · ·
7	— — · · ·	7	— — · ·
8	— — — · ·	8	— · · · ·
9	— — — — ·	9	— · · —
0	— — — — —	0	——

Abbreviated Continental Morse Figures.

1	· —	6	— · · · ·
2	· · —	7	— · · ·
3	· · · —	8	— · ·
4	· · · · —	9	— ·
5	· · · · ·	0	—

Punctuation and Other Signs.

Continental Morse.

Sign		Code
Full stop	(.)	· · · · · ·
Semicolon	(;)	— · — · — ·
Colon	(:)	— — — · · ·
Comma	(,)	· — · — · —
Note of interrogation, or, request for a repetition	(?)	· · — — · ·
Note of exclamation	(!)	— — · · — —
Apostrophe	(')	· — — — — ·
Hyphen or dash	(-)	— · · · · —
Fractional bar	(/)	— · · — ·
Brackets. *This sign must be made both before and after the words which are to be bracketed*	( )	— · — — · —
Inverted commas. *Must be made before and after the words which are to be quoted*	(" ")	· — · · — ·
Underline. *Must be made before and after words which are to be underlined*		· · — — · —
Preliminary call. *To precede every transmission*		— · — · —
Double dash. *Generally called the "break sign." The signal separating preamble from address, address from text and text from signature*	(=)	— · · · —
End of message		· — · — ·
Error. *Means, "Erase." Some operators, however, use the repetition signal*		· · · · · · · ·
Invitation to transmit		— · —
Wait	(AS)	· — · · ·
"Received" signal		· — ·
Distress call. *Formerly* CQD	(SOS)	· · · — — — · · ·
"All stations"	(CQ)	— · — · — — · —
End of work	(SK)	· · · — · —

Punctuation and Other Signs.

AMERICAN MORSE.

Sign	Symbol	Code
Full stop	(.)	· · — —· ·
Semicolon	(;)	· · · · ·
Colon	(:)	—· — · ·
Comma	(,)	· —· —
Note of interrogation	(?)	—· · —·
Note of exclamation	(!)	— — —·
Apostrophe	(')	· · —· · —· ·
Hyphen	(-)	· · · · · —· ·
Dash	(—)	—· · · —· ·
Fractional bar	(/)	·
Bracket (begin)	(( )	· · · · · —·
Bracket (end)	( ))	· · · · · · · · ·
Inverted commas (begin)	(")	· · —· —·
Inverted commas (end)	(")	· · —· —· —·
Underline (begin)		· · — · —· ·
Underline (end)		· · — —· —·
Dollars	($)	· · · · —· ·
Pounds (sterling)	(£)	· · · · · · —· ·
Capital letter		· · · · —· ·
Decimal point	(DOT)	—· · · · —
Paragraph	(¶)	— — — —
Per cent.		—— · ——
&		· · · ·

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